NATIONAL LAKE Blitz

NATIONAL LAKE BLITZ

VOLUNTEER MONITORING SUMMARY REPORT

YEARS 1-3

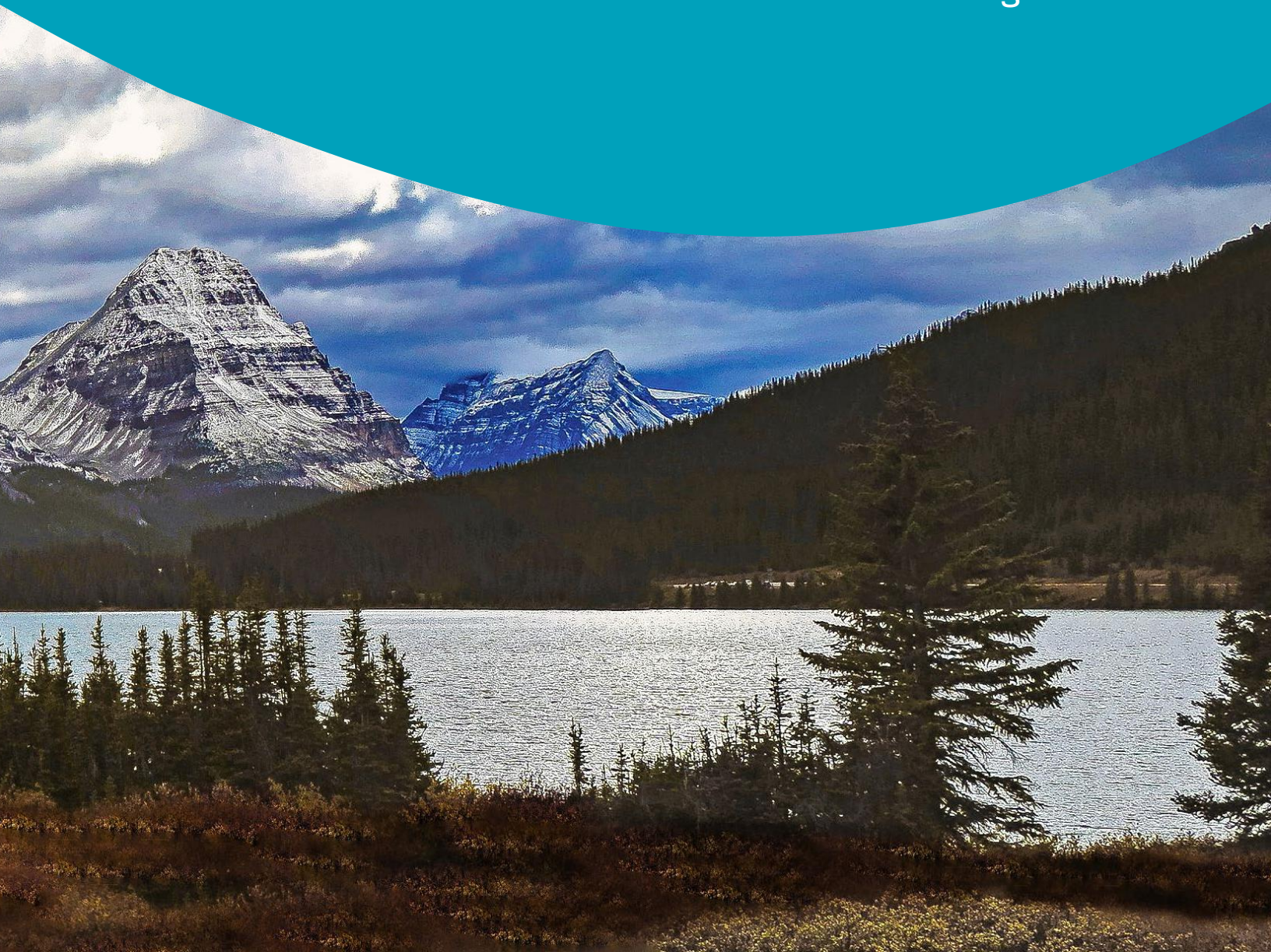
Living Lakes CANADA

Photographer: Joe Winkens
Location: Lake Morraine, AB (2023)

Land Acknowledgement

Photographer: Rick Tegeler
Location: Bow Lake, AB (2023)

Living Lakes Canada acknowledges that the National Lake Blitz program takes place on the Traditional Territories of Indigenous Peoples across what is known as Canada, and recognizes the role and responsibility that Indigenous Peoples have to their lands and to the waters that flow through them.



Acknowledgements

The National Lake Blitz is made possible by the hard work and dedication of our volunteers across Canada. Thank you for sharing your time and your love for lakes.

Thank you to our funders whose generous support provided kits to volunteers, prizes to participants, the development of resources and enabled the Lake Blitz team to provide ongoing support to a growing network of lake stewards.

To our many program partners, thank you for your enthusiasm and all of the work you do to promote lake stewardship across Canada.

RBC Tech for Nature

Funded by the Government of Canada's New Horizons for Seniors Program | Canada

TD Friends of the Environment Foundation

Photographer: Matt Sanders
Location: Slocan Lake, BC (2023)

What's in the Report?

What is the National Lake Blitz?

The National Lake Blitz is an annual volunteer citizen science program with the goal of encouraging the widespread monitoring of lakes across Canada. At their chosen lake from May to September, Lake Blitz volunteers collect temperature readings, shoreline photos of their location and the colour of the water, and more. Participants gain a firsthand understanding of how climate and other impacts are affecting lake health and biodiversity. The program also aims to promote improved water literacy through monitoring and to foster a national network of lifelong lake stewards. All the data that's collected is added to the interactive Lake Observation Map that can be viewed in real time.

MISSION

The mission of the National Lake Blitz is to encourage and amplify nationwide water stewardship to raise awareness around lake health and support biodiversity across Canada. Through community engagement, education, and data collection, the Lake Blitz empowers individuals and organizations to actively participate in simple lake ecosystem monitoring and conservation.

VISION

A nationwide network of lake stewards dedicated to caring for their local lakes and championing data-driven decision making for the sustainable management of lakes now and into the future.

Photographer: Travis Adams

Message from the Lake Blitz Team

The Living Lakes Canada Lake Blitz team is delighted to present the outcomes of the first three years of the National Lake Blitz program. This report is a celebration of the program's achievements, a tribute to lake stewardship, and a glimpse into the remarkable efforts of hundreds of volunteers across Canada. It showcases stories and data from volunteers nationwide, exemplifying the diverse expressions of lake stewardship in the face of a changing climate and biodiversity loss.

Our heartfelt appreciation goes to the volunteers, partners, colleagues, and supporters whose enthusiasm has fuelled this initiative. In 2021, Lake Blitz began as a simple idea to involve people across Canada in lake monitoring. Partnering with conservation leaders, we developed easy methods for volunteers to gather important lake health data like photos and temperature measurements. Starting small in Ontario and BC, it's grown into an annual volunteer program involving hundreds of people across 11 provinces and territories.

While unable to encompass all volunteer efforts, this report features volunteer highlights and datasets from across the country. Data points are broken down by national regions and "monitoring clusters" (i.e. areas with high volunteer density). For those interested in further exploring the dataset, we encourage you to visit the Water Hub or contact the Lake Blitz team: lakeblitz@livinglakescanada.ca.

We're excited for the coming year to connect more people with their lakes and nurture lake stewardship for a more water-literate society.

Happy monitoring in 2024!

Camille LeBlanc
Lake Blitz Program Manager

Kaite Martin
Lake Blitz Program Coordinator

The Lake Blitz Volunteers

Each of our National Lake Blitz volunteers has their own unique reason for selecting a lake to monitor during the Lake Blitz monitoring season. Though they have all different reasons to start caring for a lake, they share a love for the biodiversity and natural ecosystems that their lake supports. In turn, they want to support the lake they love through monitoring.

While there are limitations around the use of the citizen science data, the sky is the limit when it comes to the educational and awareness-raising value of the lake monitoring process.

Lake Blitz volunteers can be alerted to concerning trends through their monitoring and become champions of community lake stewardship efforts, while contributing to a more water-literate society and deepening their connection to not only their chosen lake, but watersheds in general.

- **Volunteers use the Lake Blitz kits to collect their data and then upload their data to the Lake Blitz Observation Map.**
- **Volunteers record lake and air temperatures, conduct biodiversity assessments, and report invasive species.**
- **They also document issues like pollution, littering, and algal blooms.**

Volunteer Spotlight

"We are fortunate to live in an area surrounded by hundreds of lakes and it's important to understand the impact human activities have on these lakes. My biggest concern is that adverse human activities will limit access to our freshwater lakes and not provide the recreational activities that our family has been able to enjoy for many years."

~ Inder Paul Dhaliwal, Shuswap Lake, BC (2022 Volunteer)

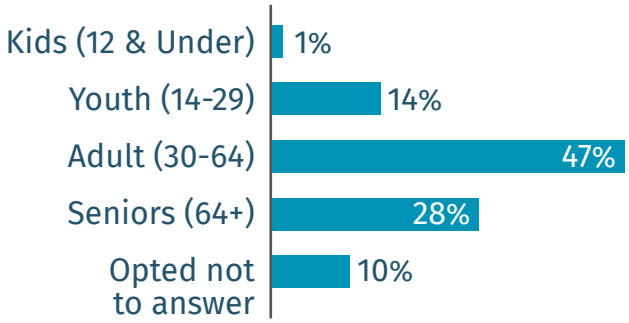
With the success of the National Lake Blitz in 2021 and 2022, we decided to collect more information about our growing volunteer base in 2023. In our 2023 online registration form, optional questions around gender, age, identity and experience were included.

GENDER

51% 26% 1%

OPTED NOT TO ANSWER 22%

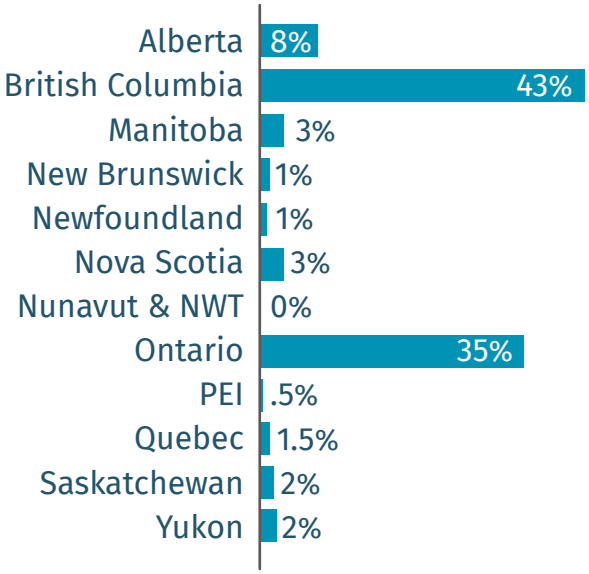
AGE



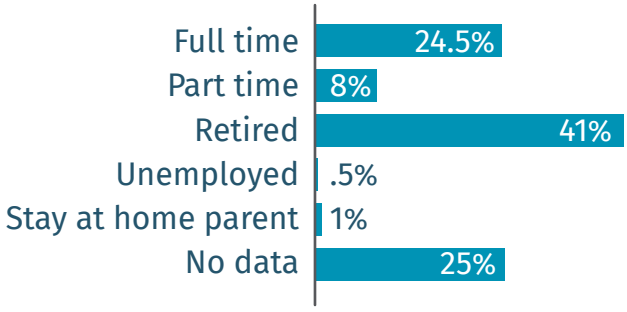
IDENTIFY AS INDIGENOUS 3%

IDENTIFY AS VISIBLE MINORITY 2%

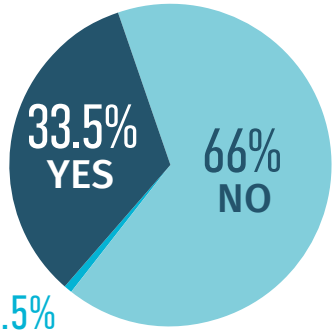
LOCATION OF VOLUNTEERS



EMPLOYMENT STATUS



MONITORING EXPERIENCE:



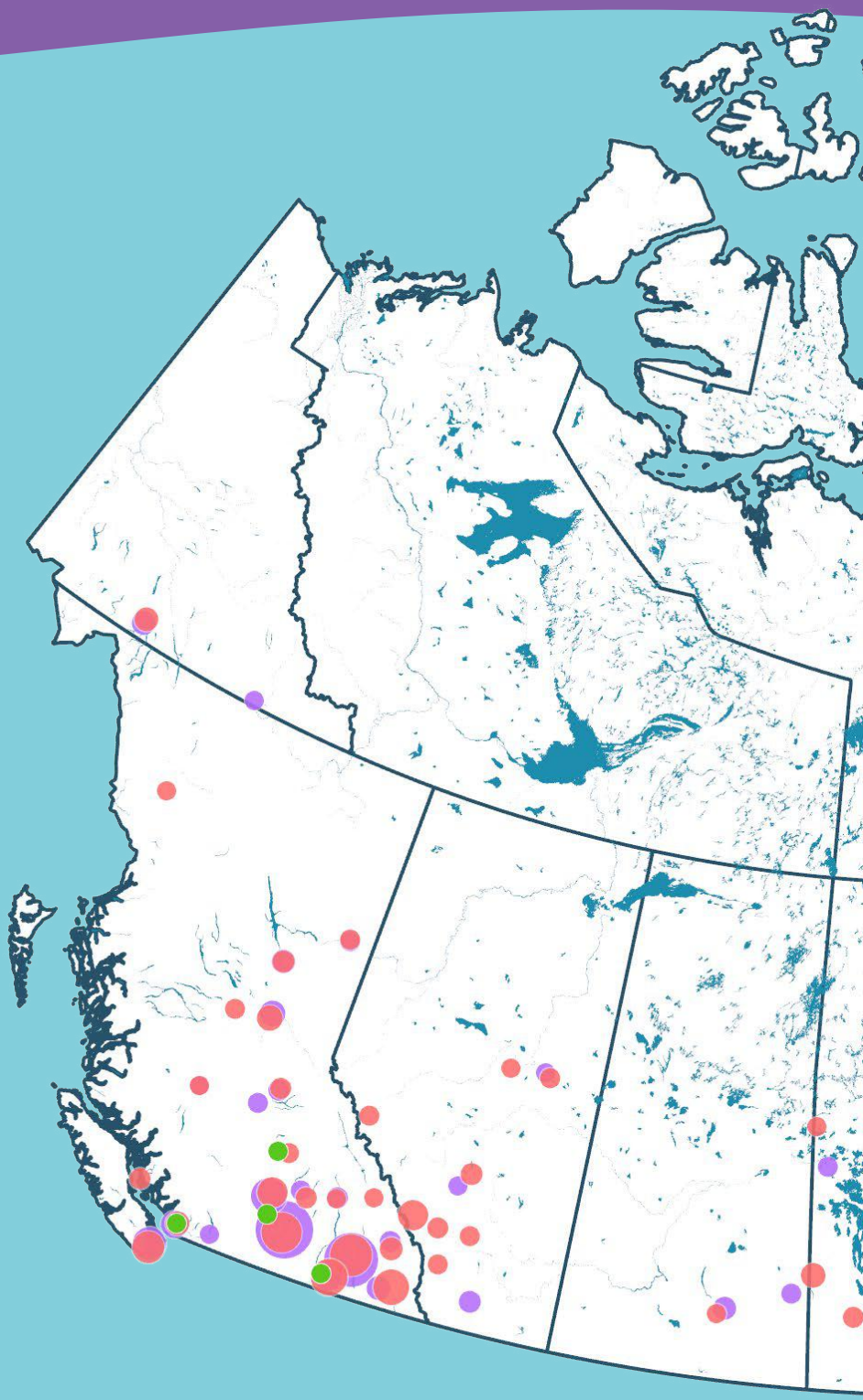
OPTED NOT TO ANSWER 0.5%

National Monitoring Snapshot

2023
Lakes Monitored: **209**
Observations: **19,346**
Active Volunteers: **224**
Registrants: **445**

2022
Lakes Monitored: **111**
Observations: **8,876**
Active Volunteers: **160**
Registrants: **350**

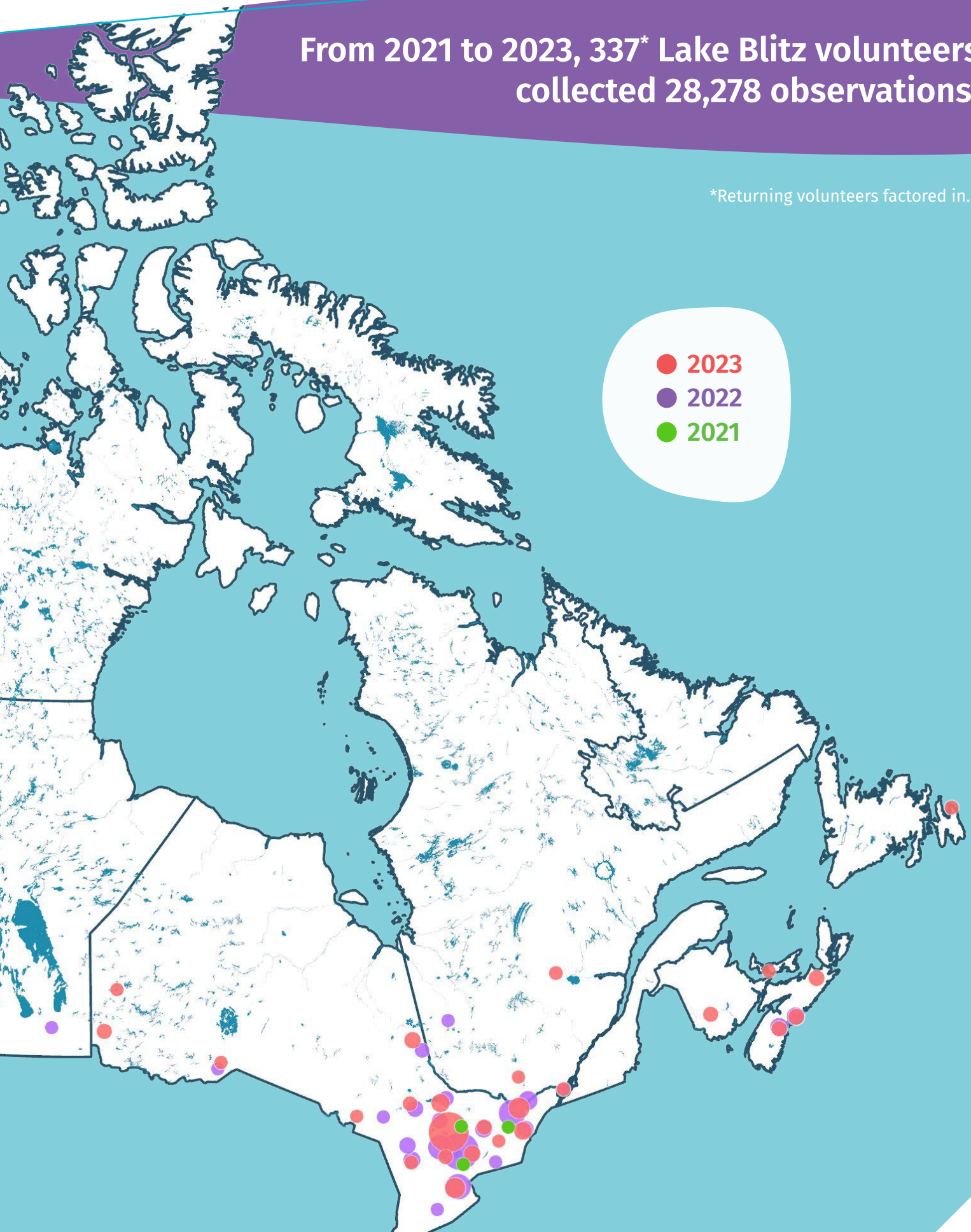
2021
Lakes Monitored: **7**
Observations: **56**
Active Volunteers: **7**
Registrants: **56**



The data collected by Lake Blitz volunteers is housed in the interactive Lake Observation Map. To visit the map, click or scan the QR code.

From 2021 to 2023, 337* Lake Blitz volunteers collected 28,278 observations!

*Returning volunteers factored in.

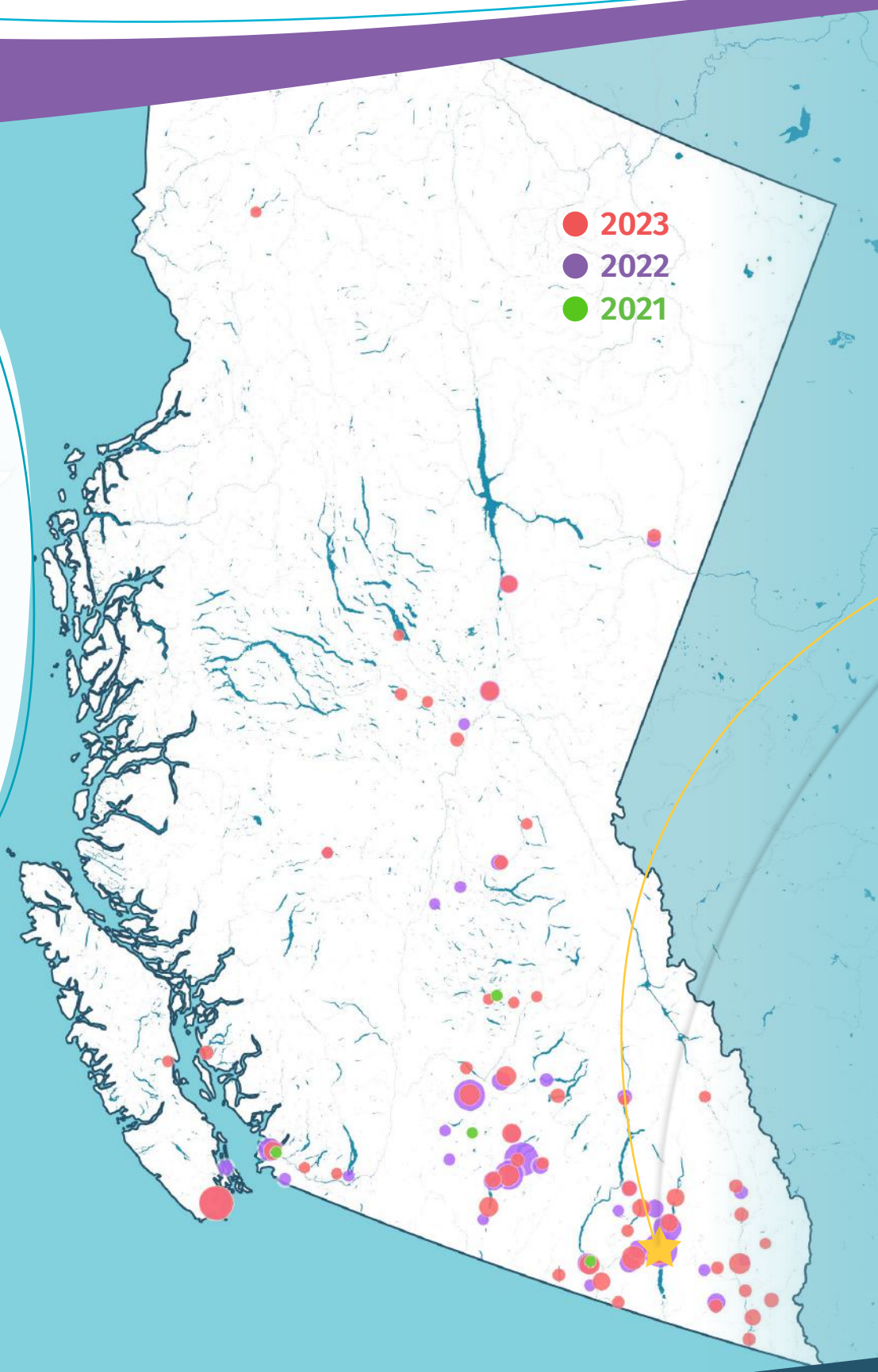


British Columbia Snapshot

2023
Lakes Monitored: **69**
Observations: **8,851**
Active Volunteers: **84**
Registrants: **193**

2022
Lakes Monitored: **67**
Observations: **4,193**
Active Volunteers: **47**
Registrants: **127**

2021
Lakes Monitored: **4**
Observations **44**
Active Volunteers: **4**
Registrants: **23**



Monitoring Clusters

The Okanagan
The Kootenays
(see pages 14-15)

Volunteer Spotlight

"I was doing all of my high school courses online so I wanted to find a reason to get outside more and this was one of the opportunities I found! ... I was creating a plant and animal guidebook based on the area as a project in my careers class, so I would do the sampling and document wildlife while I was there."

~ **Lily Liang, McLean Ponds, BC (2023 Volunteer)**

DATASET SPOTLIGHT

VOLUNTEER: Gary Hunter
LAKE: Kootenay Lake
WHEN: 4:00 pm PST on July 22, 2023
AIR: 32˚ C
WATER: 25˚ C
WILDLIFE: Northern Pike Minnow
INVASIVE SPECIES: Common tansy
ISSUES & CONCERNS: Seven dead fish on shoreline

Most Monitored Lake in British Columbia!

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

- Herons • Magpie
- Perch • Otters
- Warblers

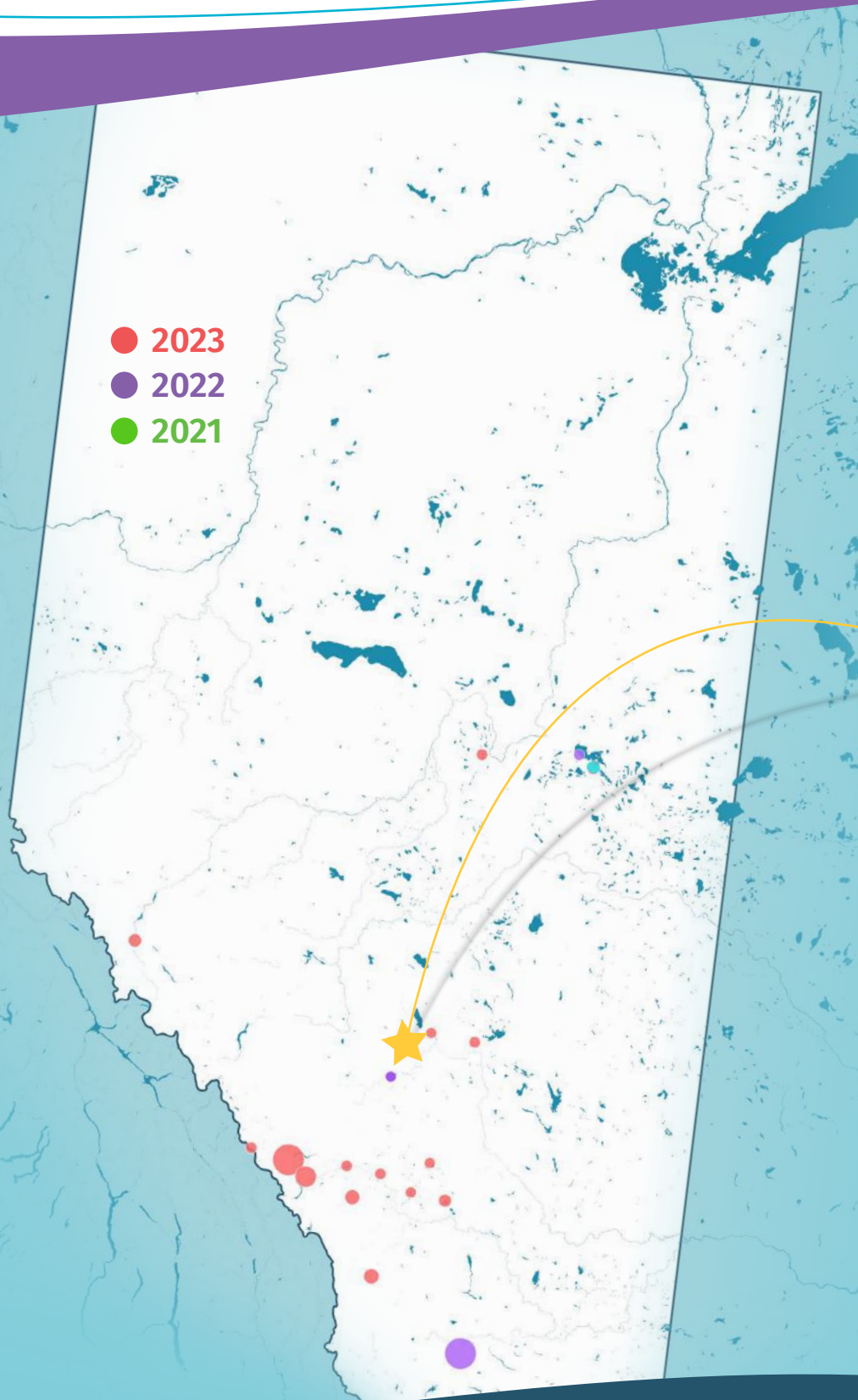
Photographer: Giselle Chouniard
Location: Kootenay Lake, BC (2023)

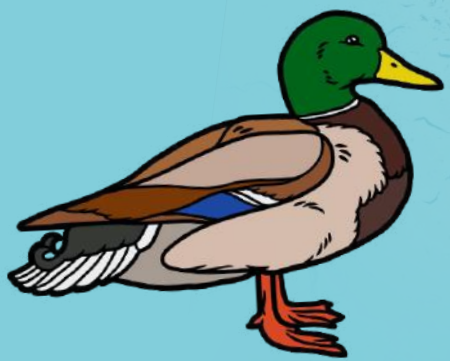
Alberta Snapshot

2023
Lakes Monitored: **29**
Observations: **1,553**
Active Volunteers: **14**
Registrants: **41**

2022
Lakes Monitored: **5**
Observations: **181**
Active Volunteers: **4**
Registrants: **18**

2021
No Lake Blitz monitoring in 2021





Photographer: Laurie Gathercole
Location: Sylvan Lake, AB (2023)

Photographer: Jean Wallace
Location: Frank Lake, High River, AB

Wildlife Story

Did you know that Alberta is home to the American White Pelican (*Pelecanus erythrorhynchos*)?

American White Pelicans catch fish from the surface of water, while other Pelican species dive to catch their food. You can find Pelicans in Alberta from March or April until September or October before they head south to hang out in the gulf of Mexico's estuaries, lakes, and rivers. Pelicans live for over 17 years and mate for life. Even though American White Pelicans are globally listed as a species of least concern, they are still adversely impacted by habitat loss, boating disturbances, and poaching.

~ Resource: Alberta Institute For Wildlife Conservation, 2016

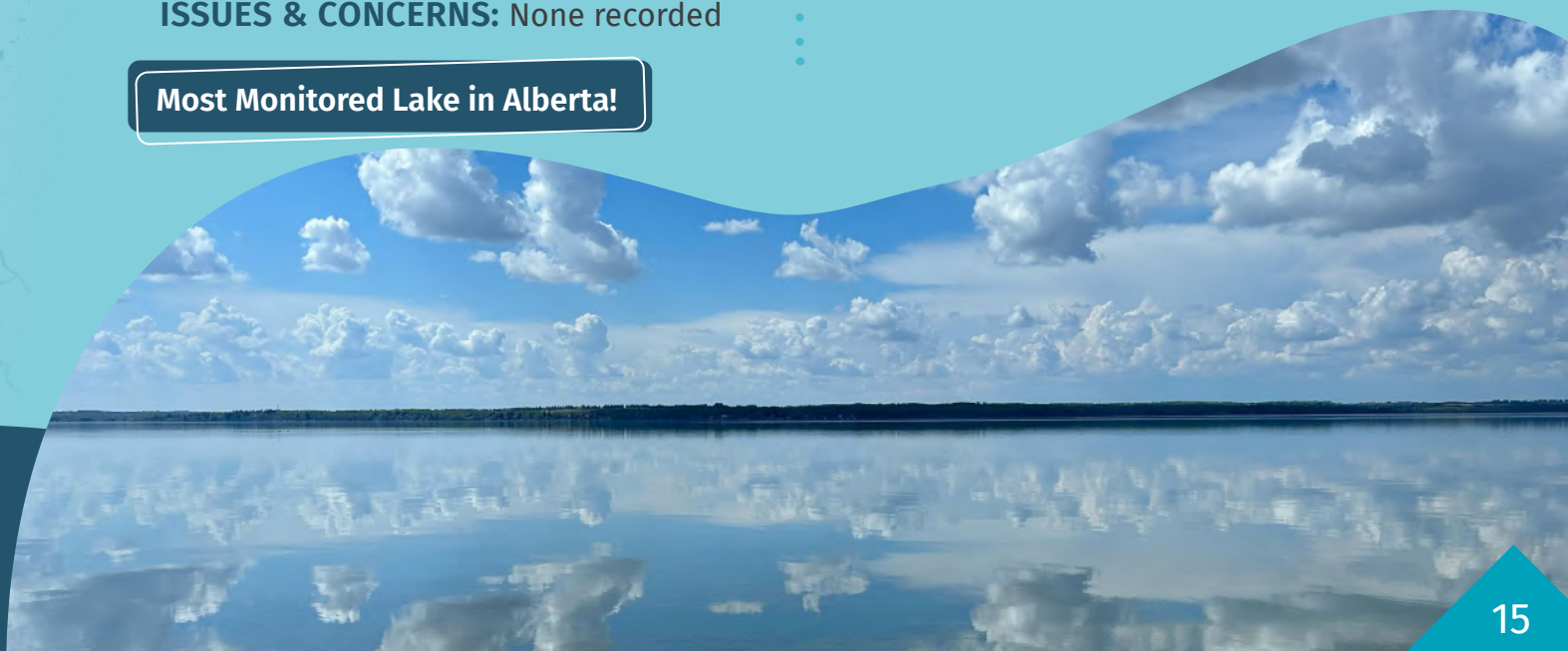
DATASET SPOTLIGHT

VOLUNTEER: Laurie Gathercole
LAKE: Sylvan Lake
WHEN: 11:49 pm MDT on May 25, 2023
AIR: 16˚ C
WATER: 14˚ C
WILDLIFE: American White Pelican
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

Most Monitored Lake in Alberta!

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

• Mallard • Common Loon • American Coots
• Red-winged Blackbird
• Canada Goose

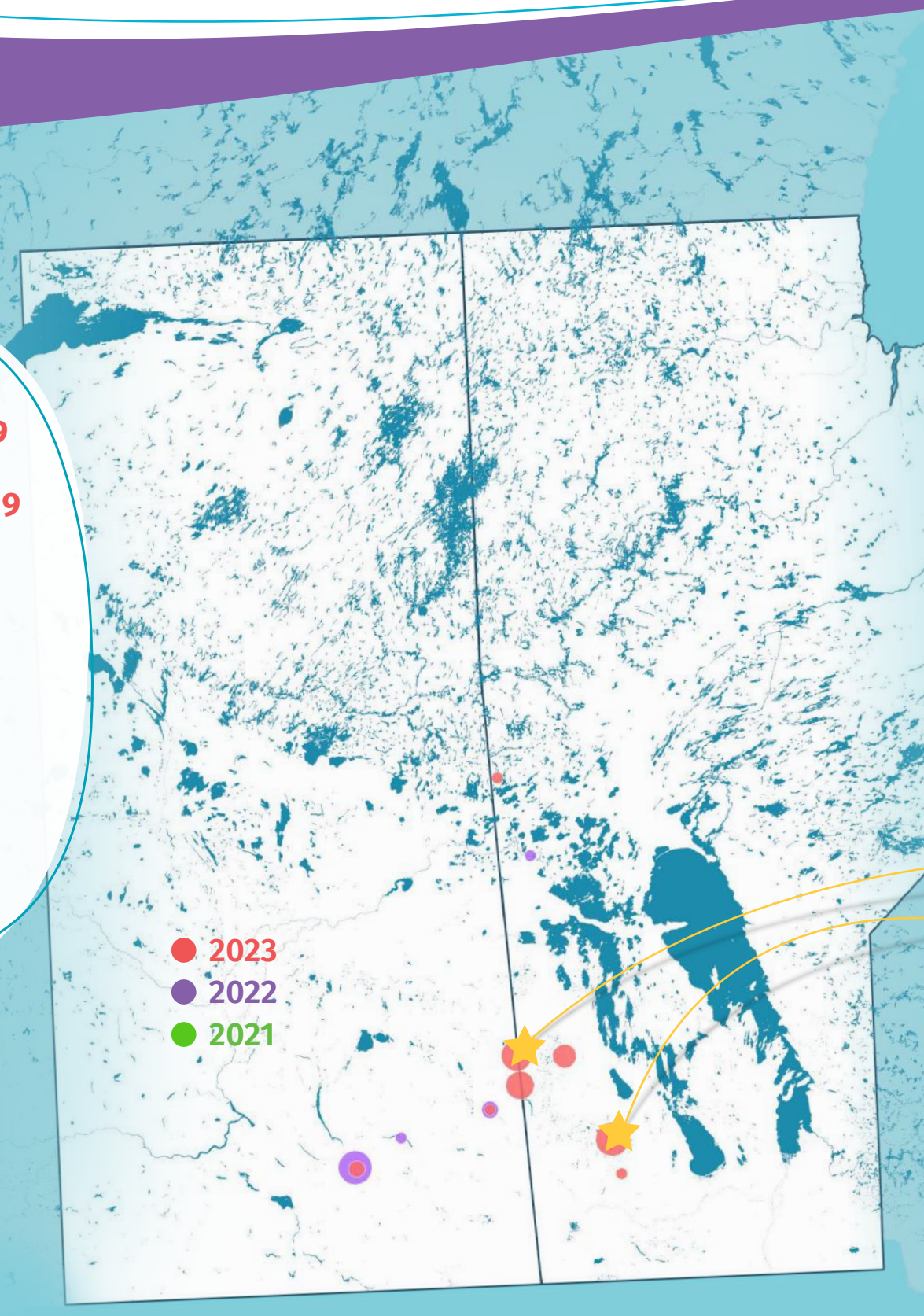


Saskatchewan & Manitoba Snapshot

2023
Lakes Monitored: **9**
Observations: **633**
Active Volunteers: **9**
Registrants: **30**

2022
Lakes Monitored: **8**
Observations: **228**
Active Volunteers: **6**
Registrants: **12**

2021
No Lake Blitz monitoring in 2021



Winner of Judges' Favourite for Most Impacted 2022 Lake Biodiversity Photo Challenge

Photographer: Jennifer Batiuk
Location: Lac la Biche, AB

All About Algae

Algae acts as an important health indicator for freshwater ecosystems as they form the base of most aquatic food chains. Majority of aquatic animals are dependent on this primary producer. Algae can tell us a lot about water quality as pH and nutrient levels can affect the composition of algae. Cyanobacteria often known as blue-green algae can produce lethal neurotoxins and hepatotoxins which can lead to serious illness and death when ingested. Most algae is harmless, and as stated above is necessary for a flourishing waterbody. However, it is important to educate yourself on how to identify different algae.

~ Resource: ACAP Saint John, 2021

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

• Gull • Muskrat • Beaver
• Pelican • Carp

DATASET SPOTLIGHT

VOLUNTEER: Rowan Little
LAKE: Clear lake, MB
WHEN: 2:50 pm CST, May 14, 2023
AIR: 25˚ C
WATER: 10˚ C
WILDLIFE: Canada Goose and Common Loon
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: Pollution and algae

Most Monitored Lake in Manitoba!

DATASET SPOTLIGHT

VOLUNTEER: Bob Wynes
LAKE: Madge Lake, SK
WHEN: 11:52 am CST, September 24, 2023
AIR: 15.5˚ C
WATER: 15.5˚ C
WILDLIFE: Common Loon and Western Grebe
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

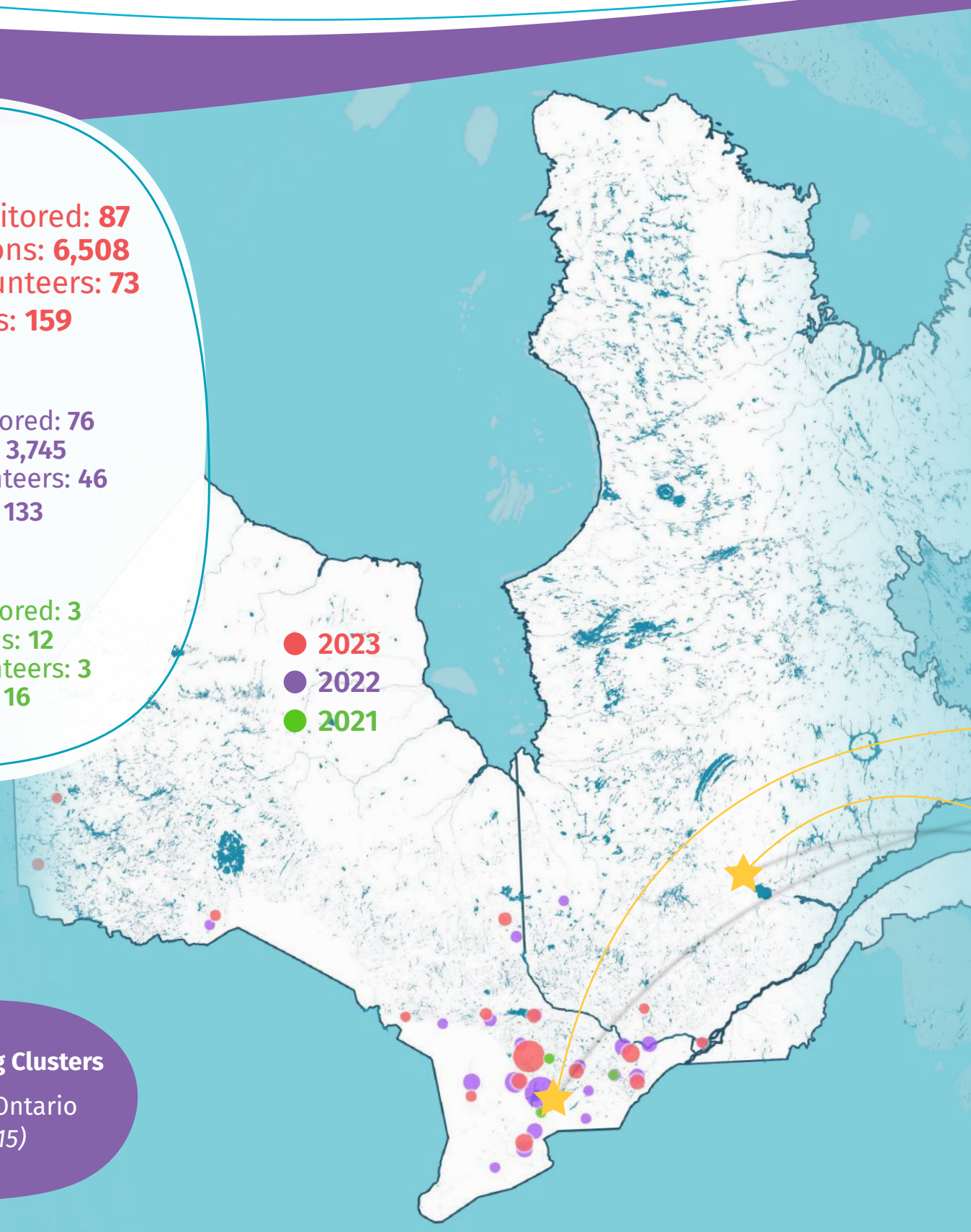
Most Monitored Lake in Saskatchewan!

Ontario & Quebec Snapshot

2023
Lakes Monitored: **87**
Observations: **6,508**
Active Volunteers: **73**
Registrants: **159**

2022
Lakes Monitored: **76**
Data Points: **3,745**
Active Volunteers: **46**
Registrants: **133**

2021
Lakes Monitored: **3**
Observations: **12**
Active Volunteers: **3**
Registrants: **16**



Monitoring Clusters

Southern Ontario
(see page 15)

Volunteer Spotlight

"I've casually monitored key environmental parameters on this lake for many years... I've always hoped such information could someday be coalesced into a national, public record that helps to chart a chronology of anthropogenic climate change impacts. So when I learned about the National Lake Blitz, it seemed like the perfect way to more systematically contribute to creating just such a widely scoped public data collection."

~ Teika Newton, Breakneck Lake, ON (2023 Volunteer)

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

• Painted Turtle • Grey Wolf
• Kingfisher • Sunfish • Robin

DATASET SPOTLIGHT

VOLUNTEER: Patrick David
LAKE: Lac-à-Jim, QC
WHEN: 9:00 am EST on September 3, 2023
AIR: 19° C
WATER: 19° C
WILDLIFE: Bald Eagle
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

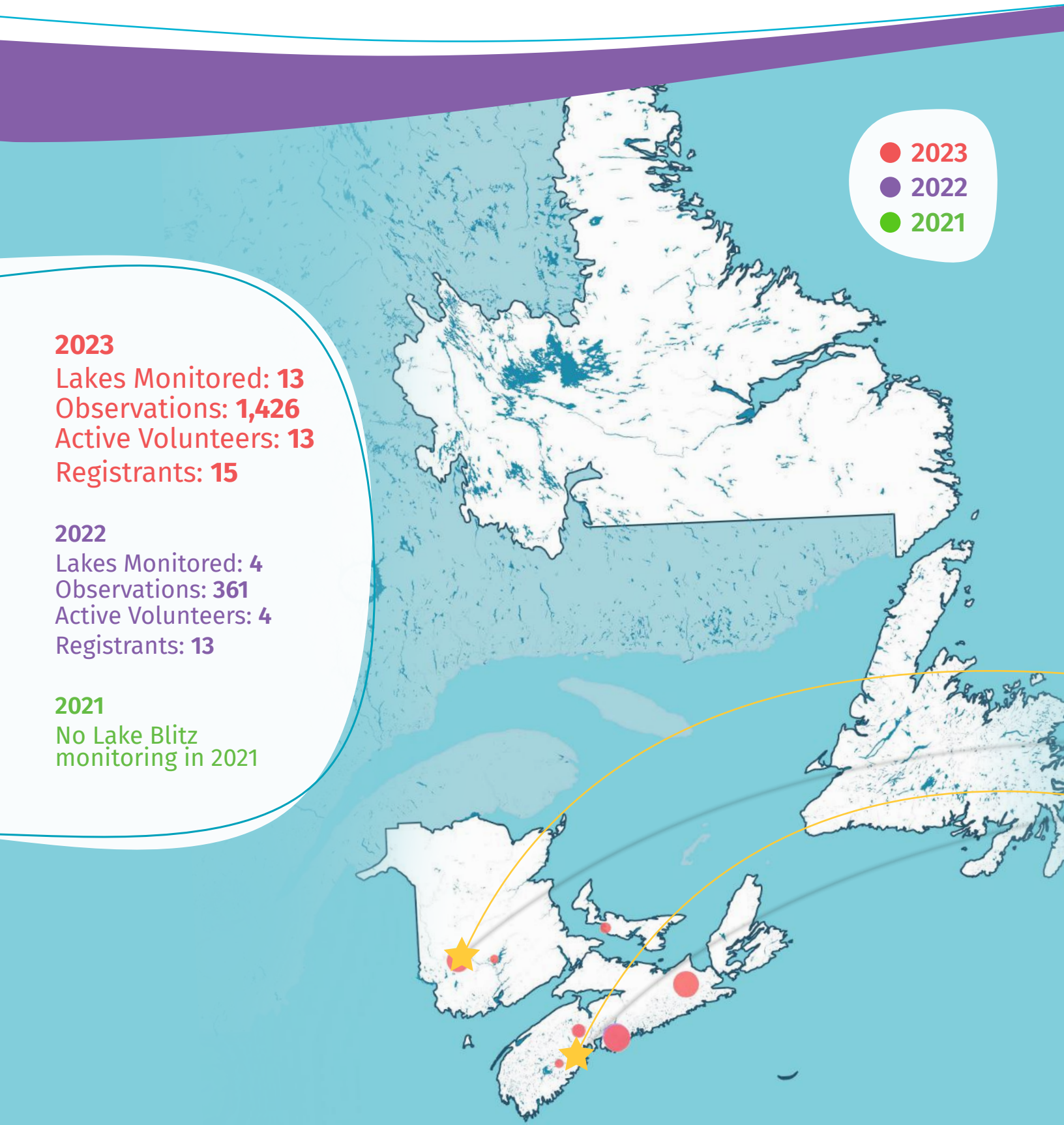
Most Monitored Lake in Quebec!

DATASET SPOTLIGHT

VOLUNTEER: Mary Ellen-Simmerson
LAKE: Lake Simcoe, ON
WHEN: 1:00 pm EST on August 27, 2023
AIR: 24° C
WATER: 25° C
WILDLIFE: Kingfisher, Trumpeter Swan, Mallard, Crayfish, Gull
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

Most Monitored Lake in Ontario!

Atlantic Provinces Snapshot



2023
Lakes Monitored: **13**
Observations: **1,426**
Active Volunteers: **13**
Registrants: **15**

2022
Lakes Monitored: **4**
Observations: **361**
Active Volunteers: **4**
Registrants: **13**

2021
No Lake Blitz monitoring in 2021

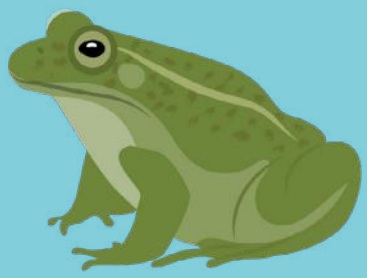
Volunteer Spotlight

"I wanted to learn more about lake ecosystems and how they're being affected by climate change. Also, I had never done any sort of water monitoring before and thought it was a great opportunity to try it out and contribute some water quality data from the East Coast. A good start is to learn more about climate change and other threats to the lakes in your area. You can take action by following or getting involved with local organizations that work to protect and steward your local lakes and help them spread the word about important issues."

~ Ben Herringer, Long Lake, NS (2023 Volunteer)

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

• Osprey • American Goldfinch • Bullfrog
• Chain Pickerel • Snapping Turtle



DATASET SPOTLIGHT

VOLUNTEER: Janice Bower
LAKE: Blysteiner Lake, NS
WHEN: 3:00 pm ADT on June 25, 2023
AIR: 26˚ C
WATER: 24˚ C
WILDLIFE: Snapping Turtle
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

Most Monitored Lake in Nova Scotia!

DATASET SPOTLIGHT

VOLUNTEER: Shirley Pegler
LAKE: Mactaquac Lake, NB
WHEN: 4:23 pm ADT on May 13, 2023
AIR: 18˚ C
WATER: 11˚ C
WILDLIFE: Bald Eagle, Chickadee, American Robin
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded

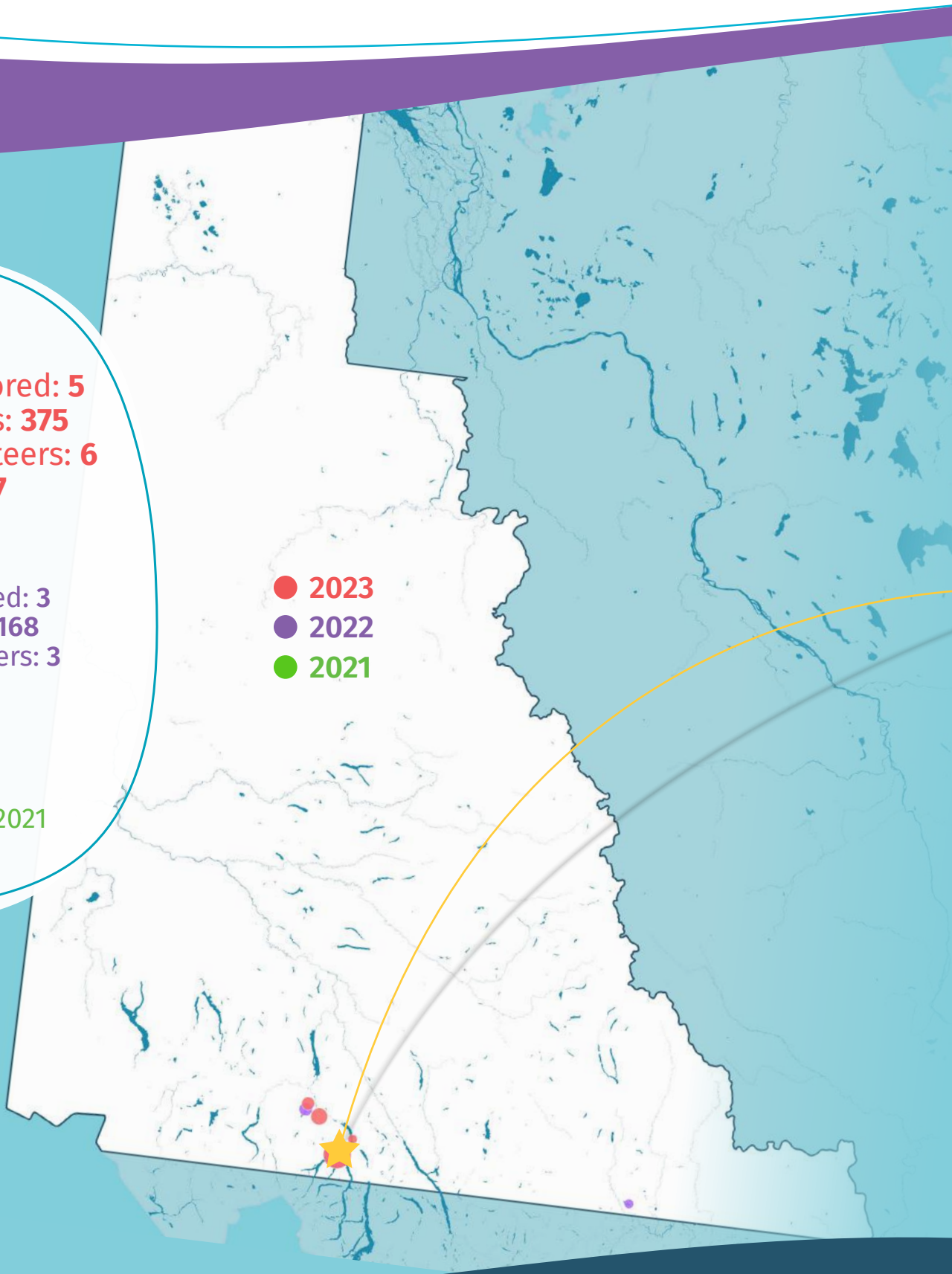
Most Monitored Lake in New Brunswick!

Yukon Snapshot

2023
Lakes Monitored: **5**
Observations: **375**
Active Volunteers: **6**
Registrants: **7**

2022
Lakes Monitored: **3**
Observations: **168**
Active Volunteers: **3**
Registrants: **3**

2021
No Lake Blitz monitoring in 2021



Photographer: Gisela Niedermeyer
Location: Crag Lake, YT (2023)

Volunteer Spotlight

"We spend a lot of time in the summer bringing kids (students) out on the land at Snafu Lake and we dedicate time to teaching them about the health of the water. The kids monitor the dissolved oxygen, pH, temperature and look for invertebrates for an afternoon and then spend a couple of nights exploring and camping. We hope to instill a love for the water and a desire to protect and care for this special place."

~ Lauren Wonfor, Snafu Lake, YT (2023 Volunteer)

DATASET SPOTLIGHT

VOLUNTEER: Gisela Niedermeyer
LAKE: Crag Lake, YT
WHEN: 10:45 am MST on June 26, 2023
AIR: 14.5˚ C
WATER: 13.5˚ C
WILDLIFE: American Robin, Junco, Crossbill, Hare
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: Low water levels

Most Monitored Lake in the Yukon!

TOP VOLUNTEER WILDLIFE OBSERVATIONS FOR THIS REGION:

- Grizzly Bear • Raven
- Merganser • Hare
- Grebes

Monitoring Clusters

The three most densely monitored regions to date are the Okanagan and Kootenays in B.C., and Southern Ontario. Below are zoomed in maps for a better look at these "Monitoring Clusters"!

Okanagan, BC

Since 2021, Okanagan Lake was the second most monitored lake across Canada, with 1,800 observations collected.

DATASET SPOTLIGHT

VOLUNTEER: Gail Karish
LAKE: Okanagan Lake
WHEN: 8:15 am PST, September 22, 2023
AIR: 15˚ C
LAKE: 18˚ C
WILDLIFE: Common Loon, Canada Goose
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: Low water levels

Volunteer Spotlight

"I am concerned by the lack of awareness around the impact that motorized vehicles, such as boats and jet skis, have on lakes and the damage they cause. What everybody can do to improve our lake health is to exchange motorized boats for canoes, kayaks, paddleboats, and paddleboards."

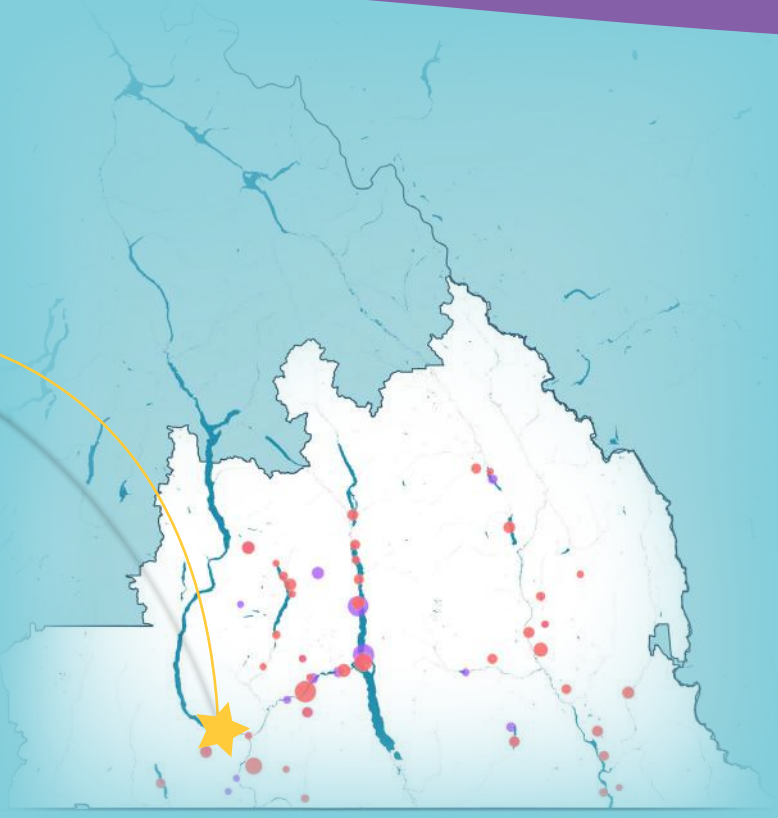
~ Linda Anderson, Lake Simcoe (2022 Volunteer)

Kootenays, BC

Since 2021, Kootenay Lake was the most monitored lake across Canada, with 5,113 observations collected.

DATASET SPOTLIGHT

VOLUNTEER: Christine Lohr
LAKE: Lower Arrow Lake
WHEN: 7:15 am PST on June 23, 2023
AIR: 14˚ C
LAKE: 17˚ C
WILDLIFE: Common Merganser, Spotted Sandpiper, Columbian Ground Squirrel, Canada Goose
INVASIVE SPECIES: None recorded
ISSUES & CONCERNS: None recorded



Southern Ontario

Since 2021, volunteers monitoring Lake Ontario and Lake Simcoe collected a total of 4,273 observations.

DATASET SPOTLIGHT

VOLUNTEER: Terry Cunningham
LAKE: White Lake
WHEN: 9:50 am EST, August 26, 2023
AIR: 20˚ C
LAKE: 23˚ C
WILDLIFE: None recorded
INVASIVE SPECIES: Zebra Mussels
ISSUES & CONCERNS: Pollution

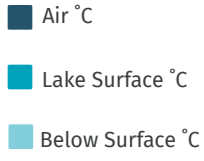
Data Summary: Part I

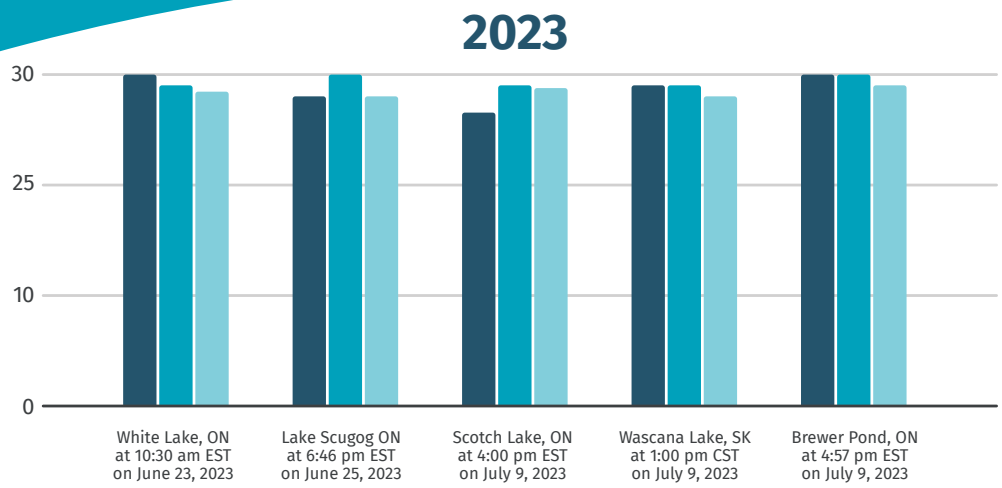
AIR & WATER TEMPERTURE

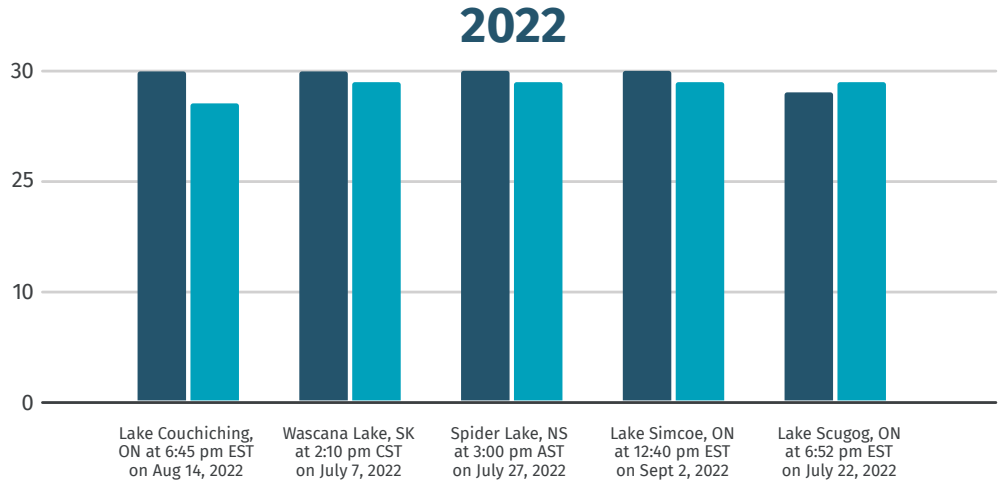
Temperature is an important water quality parameter because temperature changes can negatively impact aquatic ecosystems and water security. Increased surface water temperatures lead to increased evaporation of surface water and decrease the oxygen available in lakes (O'Reilly et al., 2015). Fish species in Canada's temperate lakes need oxygen-rich cold water to thrive and reproduce. Temperature changes decrease the health and size of notable coldwater species such as lake trout (Woolway et al., 2022). In lake environments, maintaining temperatures within a range of ±1°C from the natural ambient level is recommended.

Lake Blitz volunteers have amassed 4,027 temperature observations since 2021. Here are some of the warmest temperatures recorded in 2022 and 2023. In 2023, two temperature measurements at two different depths (just below the surface and 75 cm deeper was suggested for the second measurement) were taken as an experiment to see how the temperature would differ. The secondary temperatures presented below were collected at 23 to 113 cm below the surface.

LAKES WITH WARMEST TEMPERATURES







WATER CLARITY & PH

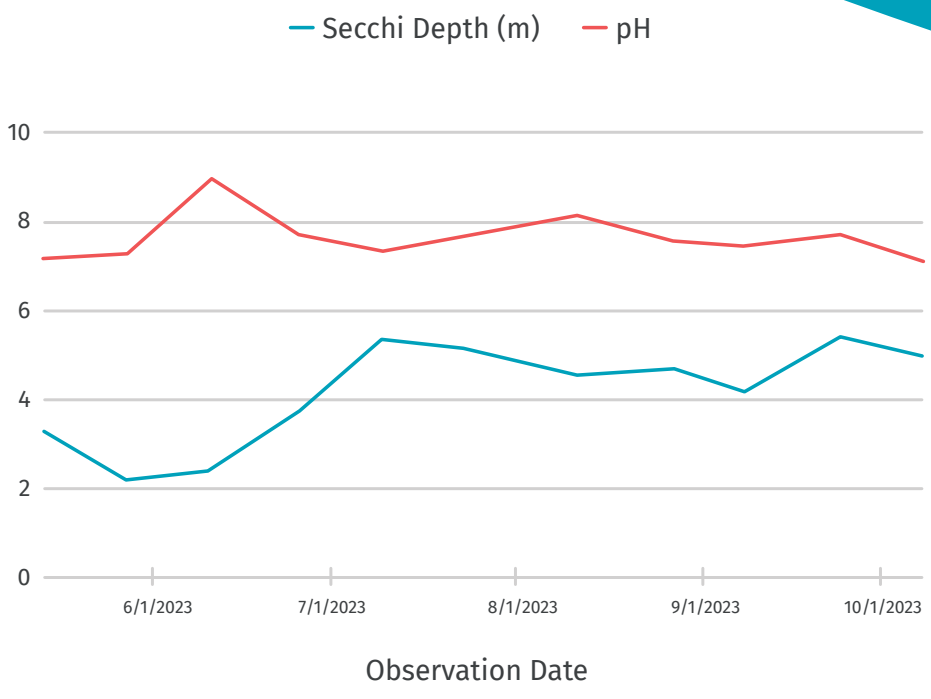
In 2023, the Lake Blitz team introduced the Level 2 Kit pilot program for volunteers interested in expanded monitoring. These kits included tools like the Secchi disk and pH meter to collect additional water quality measurements over the sampling season.

Secchi disks measure water clarity, indicating how far sunlight penetrates the lake. Reduced clarity hampers sunlight reach for plant habitat, oxygen, and food. Clearer lakes with a Secchi depth of six metres are less prone to algae blooms. Lakes with Secchi readings below three metres often have higher algae presence, which can lead to fish-killing blooms if nutrient levels increase (BCLSS, 2022).

Lake pH data is vital for lake health. Shifts in acidity or alkalinity negatively impact nutrient access for aquatic species, hinder nitrogen and phosphorus availability, and increase heavy metal solubility. Fish and other species with specific pH preferences are affected. The optimum pH for lakes and rivers is, on average, 7.4, and if the pH goes over 10, this can cause fish to die off (Water Rangers: pH in freshwater).

LEVEL 2 DATASET SPOTLIGHT

In 2023, 25 volunteers from B.C. to Nova Scotia opted to purchase a Level 2 Kit and collected 150 data points using them.



VOLUNTEER: Nancy Stadler-Salt
LAKE: Six-mile Lake, ON
WHEN: 2023

This chart to the left shows the changing water clarity and pH measurements taken by Nancy throughout the 2023 monitoring season.

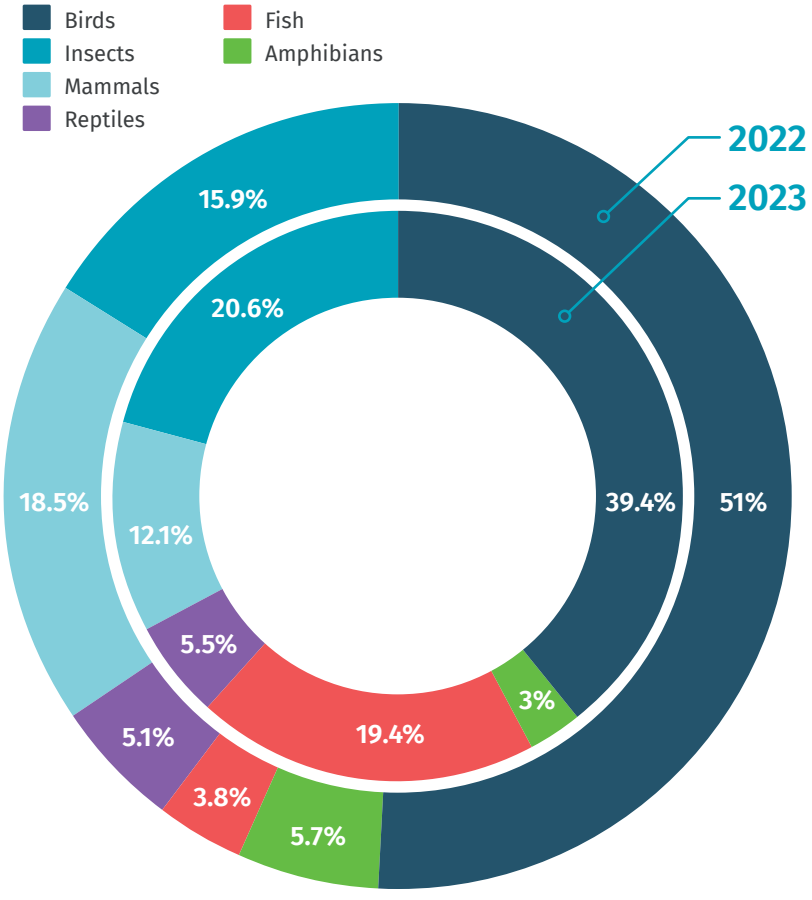
Data Summary: Part II

WILDLIFE OBSERVATIONS

Citizen science has emerged as an efficient way to support wildlife conservation and management and can be used to expand our understanding of species distribution, behavior and even phenology. Take iNaturalist for example, over 3.5 million contributors have collected over 60 million biodiversity observations on all seven continents since its start in 2008. (Citizen Science Data Collection for Integrated Wildlife Population Analyses, 2021)

Lake Blitz volunteers observed more than 165 unique species in 2022 and 150 in 2023. The most common wildlife species found in 2022 and 2023 was the Mallard, followed closely by the Canada Goose, Common Loon and Gulls. These species were found in all provinces and territories. There were many other observations of amphibians, reptiles, mammals, fish, and insects.

WILDLIFE CLASSIFICATIONS OBSERVED BY VOLUNTEERS



White-crowned Sparrow
Photographer: Lily Liang
Location: McLean Ponds, BC (2022)

Painted Turtle
Photographer: Pilar Bryson
Location: Mud Lake, ON (2023)

SHORELINE PHOTOS

The vast majority of lake biodiversity depends on shorelines during one or all life stages. It's where terrestrial and aquatic ecosystems meet, providing a diversity of species with food, habitat, and a safe space to rear young. Often referred to as the "ribbon of life", intact shoreline ecosystems are self-sustaining and more resilient than altered or developed shorelines to climate impacts like wave action (The Blue Lakes Project).

Taking photos of shorelines, lake landscapes, and water colour throughout the seasons – and from year to year – provides important clues to lake health.

Volunteers recorded over 760 lake photos in 2022 and 870 in 2023, capturing records of shoreline habitat, current levels of foreshore development, and water clarity.

Shoreline photos
Photographer: Megan Blackmore
Location: Walloper Lake, BC (2023)

Volunteer Spotlight - Special Mention

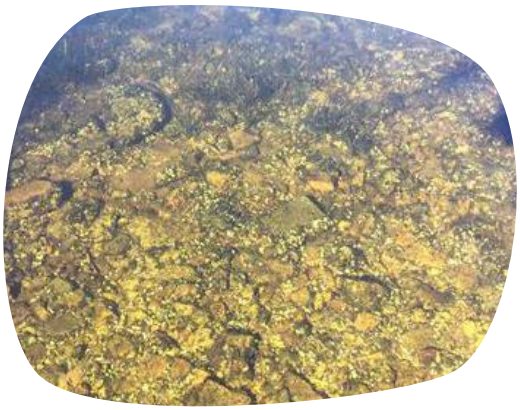
Megan Blackmore has been a Lake Blitz volunteer since the pilot year in 2021. In Megan's second season (2022) with the Lake Blitz, she monitored three lakes. She beat her record in the 2023 season by monitoring four lakes located in central B.C. Megan has stepped up to assist other volunteers in their monitoring efforts by teaching them on the importance of community science and how to identify and report invasive species. She also facilitated the launch of a Lake Blitz project in iNaturalist. She has gone above and beyond in her volunteer role.

Thank You Megan!

Eurasian Milfoil
Photographer: Anne Allen
Location: Prospect Lake, BC (2023)

INVASIVE SPECIES

Monitoring and reporting invasive species is vital for safeguarding ecosystem health, detecting biodiversity loss, and protecting native species from extinction. Early detection enhances the effectiveness of management strategies and regulatory responses, providing valuable data for scientific research. Volunteers are encouraged to connect with their provincial, local or regional invasive species organizations to learn more about what they can do to protect local ecosystems from this growing threat.



Volunteers identified 66 invasive species in 2022 and 72 in 2023 at their chosen lakes. The most common invasive plant species was Eurasian Milfoil, primarily in British Columbia and Ontario. The most common invasive wildlife species was zebra mussels, primarily in Southern Ontario: Lake Ontario and Mississippi Lake.

Zebra Mussels
Photographer: Jackie Hayes
Location: Mississippi Lake, ON (2022)

Volunteer Spotlight

"My grandfather purchased a lake property on Garbutts Lake in 1962. I am now 62 and I have owned it for 20 years after purchasing it from my mother. My attachment to Garbutts Lake runs very deep. I feel very blessed to reside in such a special place. I would love to bottle the feelings of joy I have when I sit at my kitchen window and watch nature at its best. To make a difference in the world, it takes one person at a time. I strive to be one of them."

~ Kurt Swanson, Garbutts (Norbury) Lake, BC (2023 Volunteer)

ISSUES & CONCERNS

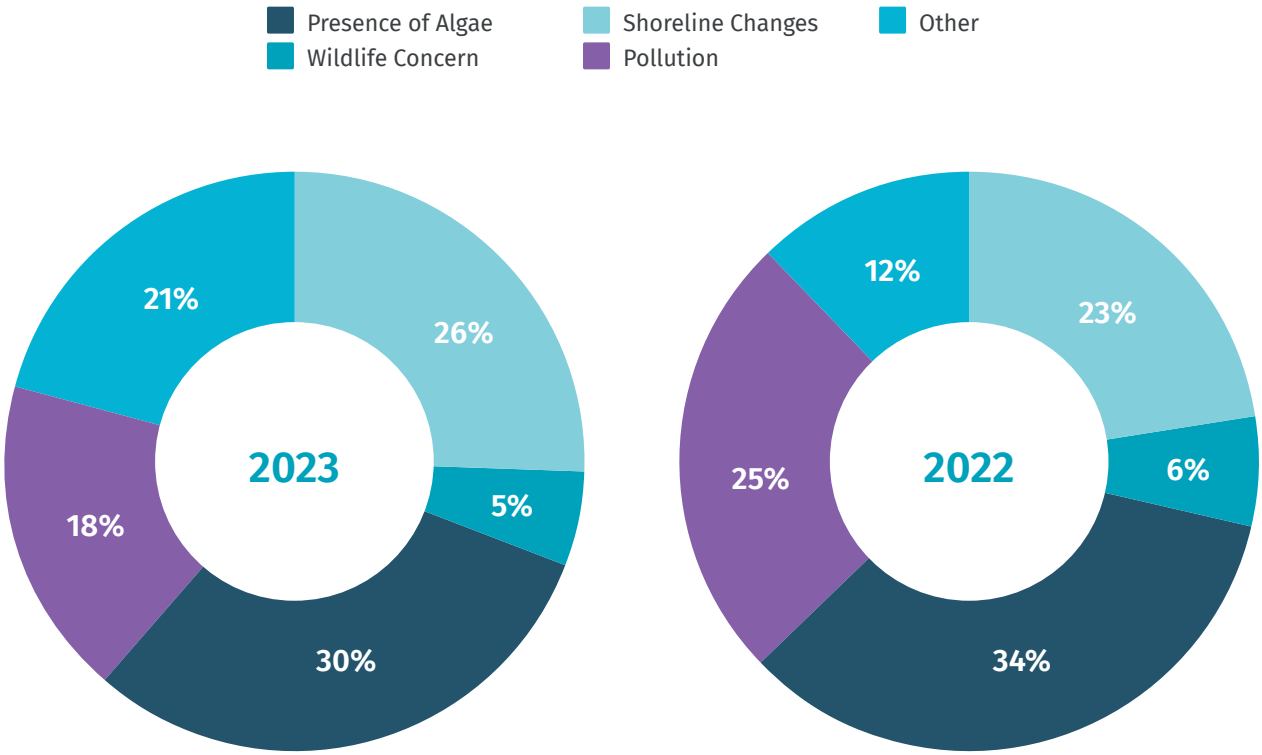
Volunteers noted 392 issues in 2022 and 223 in 2023. Main concerns included algae growth, shoreline changes, and pollution, with algae drawing significant attention due to its sudden appearance and uncertainty about harm. Shoreline changes correlated with water level fluctuations, while pollution stemmed mainly from lake littering.

These observations indicate natural lake dynamics but also potential long-term impacts. Algae presence may result from increased nutrient input, fostering lake eutrophication (BCLSS, 2022). Water level changes can signal watershed drought conditions, impacting lake ecosystems and communities (Rapid and highly variable warming of lake surface waters around the globe, 2015).

A prominent lake impact is litter, especially macroplastics breaking down into microplastics, affecting freshwater sources (Microplastics in Lakes, 2019).

Volunteers are urged to equip themselves with gloves and a bucket to collect plastic waste during lake visits.

ISSUES & CONCERNS OBSERVED BY VOLUNTEERS



In-Person Events

The Lake Blitz team delivered a number of in-person events and presentations in 2022 and 2023. These were excellent opportunities to connect with volunteers and reach new ones! Here are some of the events we hosted and attended.

EARTH DAY WATERSHED DISCOVERY - 2022

In Spring 2022, Earth Day brought members of the Kimberley Youth Action Network (KYAN) and ʔaq̓am's Guardians in Training program together for two days of watershed awareness. This group of youth received hands-on water monitoring training, which included creating site drawings, identifying different wetland types, and learning how aquifers work. They assisted in setting up a simple water monitoring system at Cherry Creek and proceeded to keep track of water levels and temperatures over the next few seasons. They were also shown how to use dissolved oxygen and turbidity meters, and check water conductivity and pH levels. The young participants developed increased awareness about threats to watershed health and what they can do to help!

KASLO SENIOR AND YOUTH MONITORING WORKSHOPS - 2022, 2023

In 2022, the Lake Blitz partnered with the Kaslo Community Service Society to hold an in-person training event for seniors in Kaslo, BC at a public dock on Kootenay Lake. After the training, six senior volunteers signed up to monitor Kootenay Lake, Fish Lake, and Mirror Lake, yielding four complete datasets. In 2023, the Lake Blitz returned to Kaslo to train both youth and senior volunteers in collaboration with the "Kaslo Up the Lake Network". The workshop trained the youth in monitoring and assisting seniors with data entry, and prepared all the volunteers for their monitoring of Kootenay and Duncan Lakes for the 2023 monitoring season.

NELSON WEED PULL & PIZZA - 2023

In July 2023, the Lake Blitz team partnered with the Central Kootenay Invasive Species Society (CKISS) to host a half-day Aquatic Invasive Species (AIS) workshop on the shores of Kootenay Lake, BC. Participants learned about AIS identification; best management practices when working and playing around water to prevent their spread; and how to remove them. Their new knowledge was tested with a game of AIS Jeopardy, and they helped collect a large amount of invasive species, with a free pizza lunch as a reward!

GENERATE & NAVIGATE - 2023

In March 2023, the Lake Blitz team participated in Inside Education's Generate & Navigate: Youth Energy, Water & Climate Leadership Summit in Canmore, AB. The Summit brought together 160 students and teachers and over 70 expert guests to advance energy, water and climate education. Youth and educators were introduced to the Lake Blitz program, took part in an outdoor watershed monitoring session, and invited to register for the 2023 Lake Blitz monitoring season. Students were excited to learn water monitoring skills and this influential event laid the foundation for further collaborations to empower and educate students about environmental stewardship.

Photographer: Jordan Hon

Lake Blitz Speaker Series

In 2022, the Lake Blitz began hosting a monthly virtual Speaker Series (previously known as the Monthly Meet-ups) for volunteers and the public. These free events feature expert speakers on topics of interest requested by volunteers in their registration forms.
Here are All the brilliant speakers who joined us in 2022 and 2023.

2023

- **June: Great Lakes and Citizen Science**
  - **Nancy Stadler-Salt**, Great Lakes Program Coordinator for Environment and Climate Change Canada
- **July: Algae in Watersheds: Friend or Foe?**
  - **Roxanne MacKinnon**, Executive Director for Atlantic Coastal Action Program (ACAP)
- **August: Why do we need natural lake shorelines?**
  - **Christine Callihoo**, Executive Director for Stewardship Centre for BC
- **September: Sustainable Lake Recreation for Healthy Waters**
  - **Emma Bowins**, Program Manager for Lake Windermere Ambassadors

2022

- **June: Invasive Species Monitoring**
  - **Katie Swinwood**, Invasive Species Council of BC
  - **Cassidy Patton**, Invasive Species Council of BC
  - **Rebecca D'Orazio**, Invasive Species Centre
- **July: Aquatic Wildlife Conservation**
  - **Neil Fletcher**, BC Wildlife Federation
  - **Grace Wiley**, The Land Between (Turtle Guardian Project)
- **August: Lake Limnology and Stewardship**
  - **Marie McCallum**, BC Lake Stewardship Society
  - **Bonny Hoty-Hallett**, New Brunswick Alliance of Lake Associations
- **September: Environmental Education and Nature-Based Learning**
  - **Jade Harvey-Berrill**, Columbia BasinEnvironmental Education Network
  - **Tovah Barocas**, Earth Rangers

"Lakes tend to store metals and toxins within the bottom. When we stir that up we are reversing that process. Sedimentation of important fish spawning habitat can destroy those habitats, can ruin mussel beds, make an increase in turbidity, and that can reduce light penetration to aquatic plants."

~ **Emma Bowins, Lake Windermere Ambassadors**

"Shorelines are some of the most ecologically productive places on earth, providing habitat for plants, microorganisms, insects, amphibians, birds, mammals and fish."

~ **Christine Callihoo, Stewardship Centre for BC**

Lake Biodiversity Photo Challenge

As the sister event to the National Lake Blitz, the annual Lake Biodiversity Photo Challenge celebrates the beauty of lakes across Canada and helps raise awareness around the impacts that are threatening their incredible biodiversity.

Lake enthusiasts from coast to coast are invited to submit their favourite lake photos to the contest using the online submission form at lakeblitzphoto.livinglakescanada.ca. Random entries are featured on Living Lakes Canada's social media platforms, while all entries are displayed in an online photo gallery. The Challenge concludes at the end of July (Lakes Appreciation Month) with winners announced in August. Two winners are selected per category: the Public Favourite Winners are determined by an online voting system in the photo gallery, and a panel of judges chooses the Judges' Favourite Winners. All winners are recognized in a nation-wide announcement and receive prizes from our generous prize sponsors.

Click or scan the QR codes to view online photo galleries for each year.

2023 - 697 Entries

2023 Public Favourite in Lake Landscapes: Mitchell Brown, Moraine Lake, AB

2022 - 494 Entries

2022 Public Favourite in Kids Category: Braelyn Sterling, Golden Lake, ON

2021 - 160 Entries

2021 Most Impactful: Tim Hicks, Slocan Lake, West Kootenay, BC

A big thanks to our Photo Challenge Gift Sponsors!

FLOAT-EH

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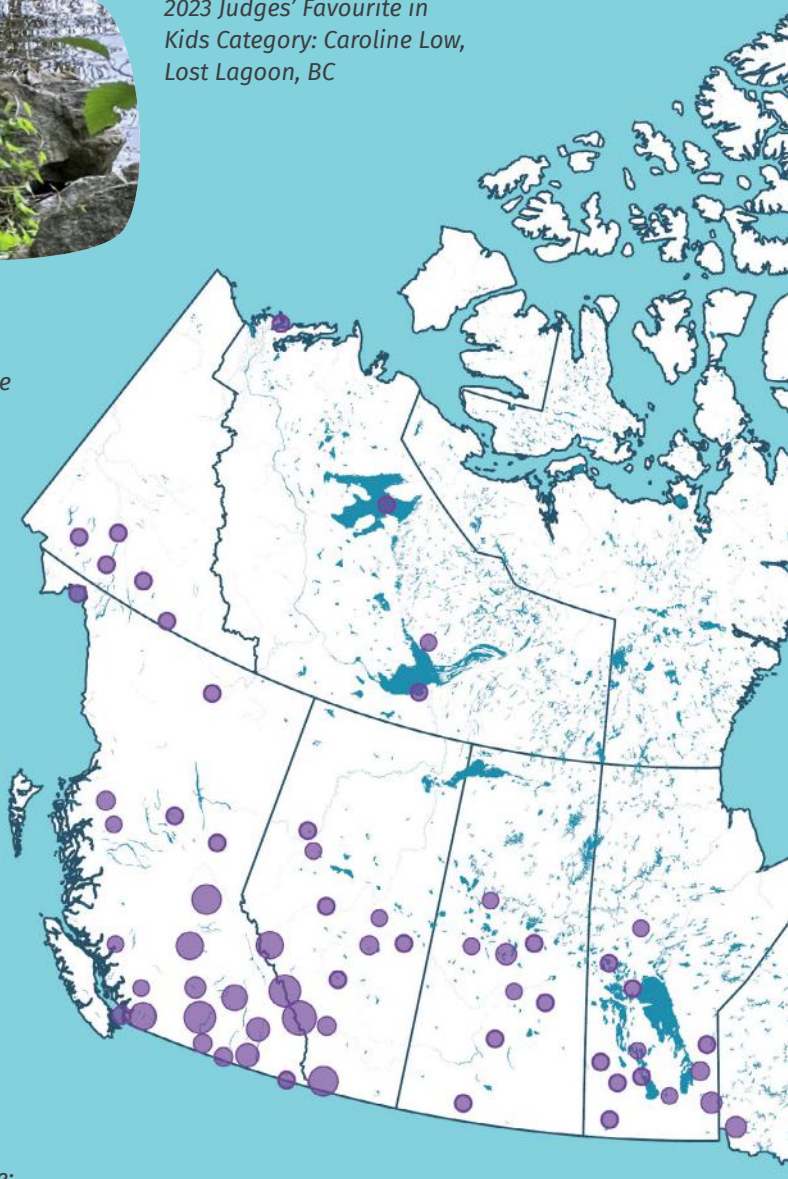
Lake Biodiversity Photo Challenge:
NATIONAL SNAPSHOT

2023 Judges' Favourite in Kids Category: Caroline Low, Lost Lagoon, BC

2023 Judges' Favourite in Lake Landscape: Richard Smith, Okanagan Lake, BC



2022 Public Favourite in Most Impactful: Kyndra Jones, Middle Joffre Lake, BC

2021 Most Biodiverse: Laurel Dawn, Eva Lake, Mt Revelstoke National Park, BC

2023 Public Favourite in Kids Category: Alexa Kornik, Lake Minnewanka, AB

From 2021 to 2023, 1,351 photographs were submitted to the Photo Challenge!

2021 Public Favourite: Arni Stinnissen, Lake Opeongo, Algonquin Park, ON

2023 Public Favourite in Lake Impacts: Melissa Horowitz, Lac St. Louis, QC

2022 Public Favourite in Most Biodiverse: Mitchell Brown, Blackstone Lake, ON

2023 Judges' Favourite in Lake Biodiversity: Rachelle Mack, Lake Scugog, ON

2023 Public Favourite in Lake Biodiversity: Elissa Devenz, Lake Simcoe, ON

What We've Learned

VOLUNTEER FEEDBACK

At the end of the 2022 and 2023 monitoring seasons, feedback surveys were circulated to volunteers with a range of questions about the Lake Blitz program. We received a 50% response rate from all active volunteers (116 respondents in 2023 and 74 in 2022) and here is what we heard from the survey results:

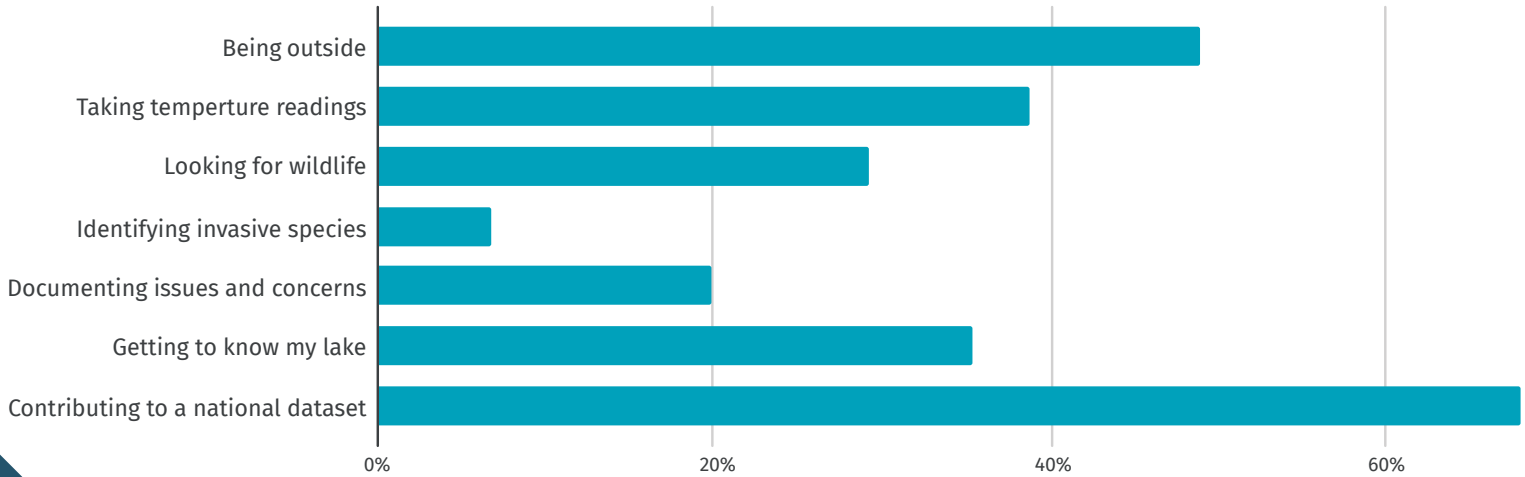
- Our volunteers' commitment to the National Lake Blitz and lake stewardship — driven by a love of lakes and concerns about climate change and human impact — is commendable.
- Many have suggested improvements like flexible scheduling, enhanced app features, and more explicit alignment with research goals.
- Usability issues with our website and app were noted, which created challenges accessing Lake Blitz educational resources.
- Volunteers expressed mixed feelings about using advanced monitoring equipment, despite wanting to learn more about water quality.
- Most respondents indicated that the Lake Blitz heightened climate anxiety. This emphasized the need for support in navigating emotional challenges when exposed to climate action work.

Thank you to our survey respondents!

WOULD YOU COME BACK NEXT YEAR?

	2023		2022	
	YES	MAYBE	YES	MAYBE
	84%	16%	81%	19%

WHAT WAS YOUR FAVOURITE PART?



Next Steps

The Lake Blitz team is committed to evolving the Lake Blitz program in ways that reflect our volunteers' experiences and feedback for a more rewarding monitoring journey. Lake Blitz Volunteers can anticipate enhancements as the program grows, including:

COMMUNICATIONS

- An improved easy-to-navigate website
- A new Lake Blitz Volunteer Community Facebook page
- Diverse presenters including artists and storytellings in our Speaker Series

OUTREACH

- Targeted outreach efforts for inclusivity across all demographics
- Strategic partnerships with organizations across Canada to address monitoring gaps
- Increased Lake Blitz promotion to raise awareness and encourage climate action

MONITORING & DATA COLLECTION

- Flexible monitoring schedules
- Simple demonstrations of data collection methods
- Clarity on data uses within and beyond the program
- Emotional support regarding climate anxiety

At its core, the Lake Blitz champions lake stewards, promoting water literacy, community connections, and collaborative networks. This initiative empowers individuals and organizations, fostering a culture of advocacy, making scientific principles accessible, and providing inclusive opportunities to connect with lakes across the country.

Looking forward, the National Lake Blitz will continue to help empower a strong stewardship ethic in Canada, emphasizing collective determination to safeguard local lakes.

Photographer: Michelle Willows
Location: Lake Superior, ON (2023)

NATIONAL LAKE Blitz

NATIONAL **LAKE**

Blitz