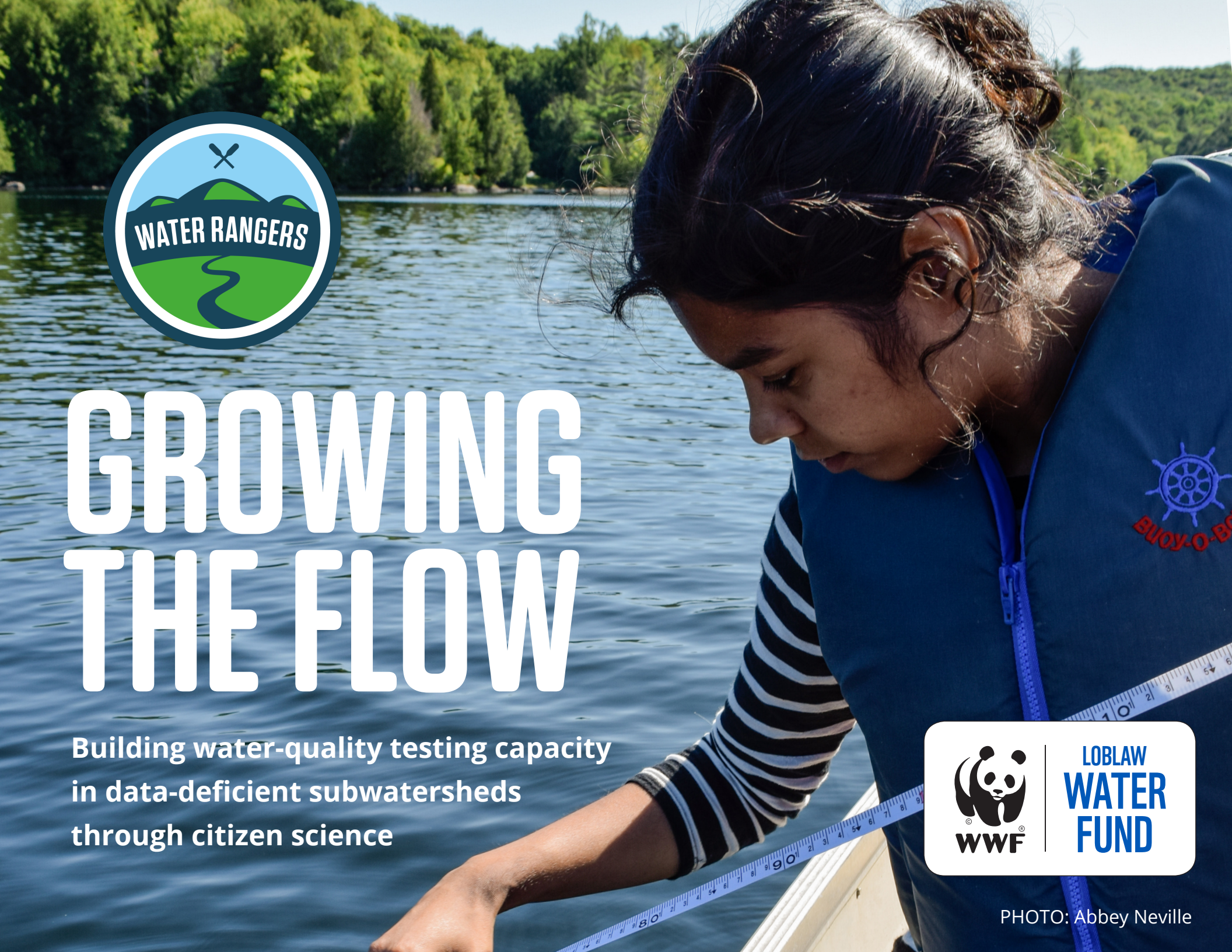
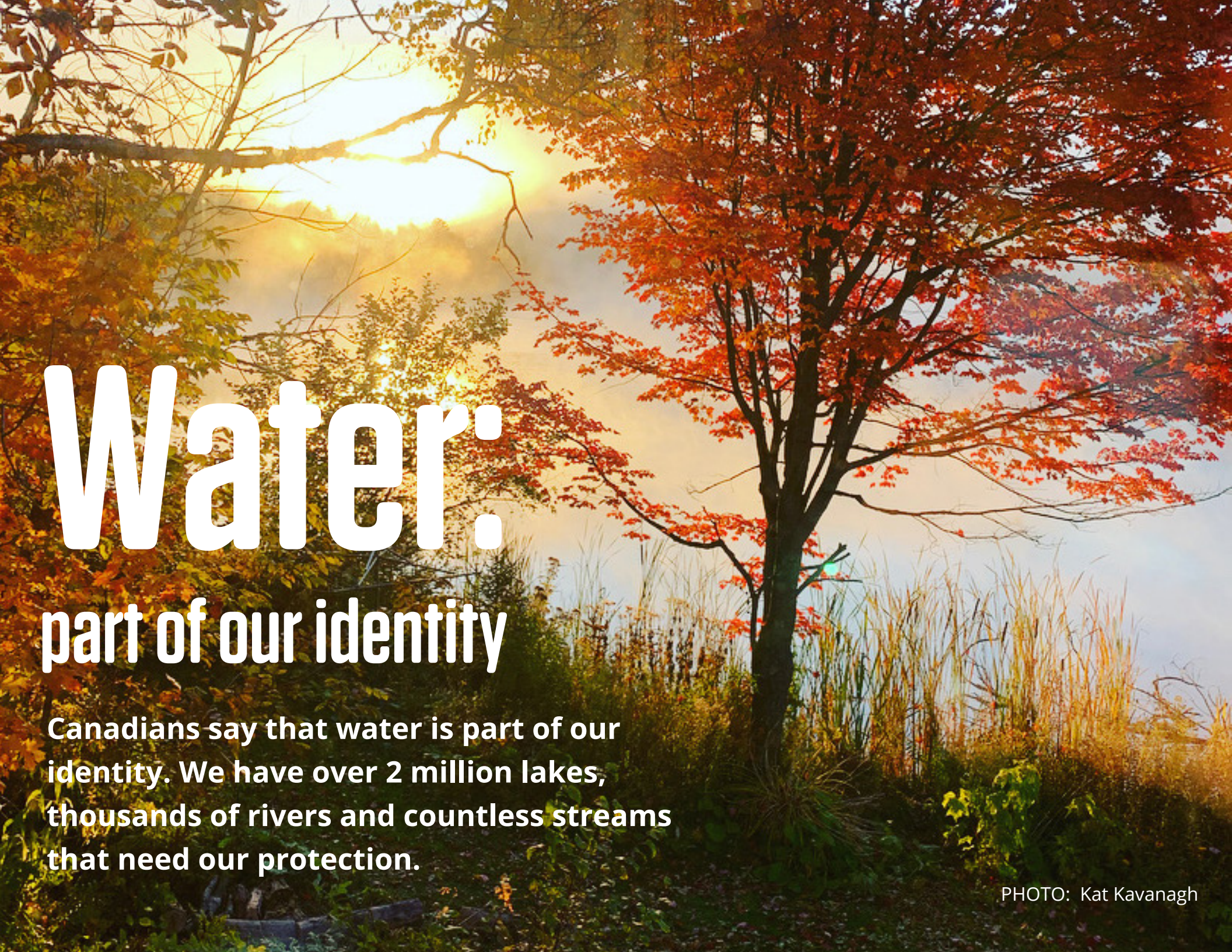

WATER RANGERS
GROWING THE FLOW
Building water-quality testing capacity in data-deficient subwatersheds through citizen science
WWF
LOBLAW WATER FUND
PHOTO: Abbey Neville



Water:
part of our identity

Canadians say that water is part of our identity. We have over 2 million lakes, thousands of rivers and countless streams that need our protection.

PHOTO: Kat Kavanagh

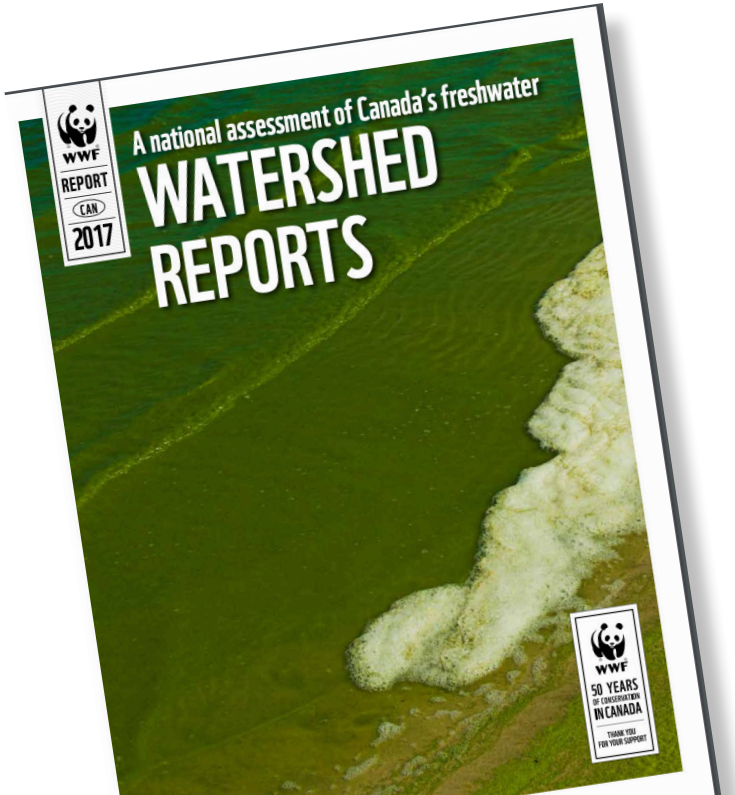
How's our water quality?

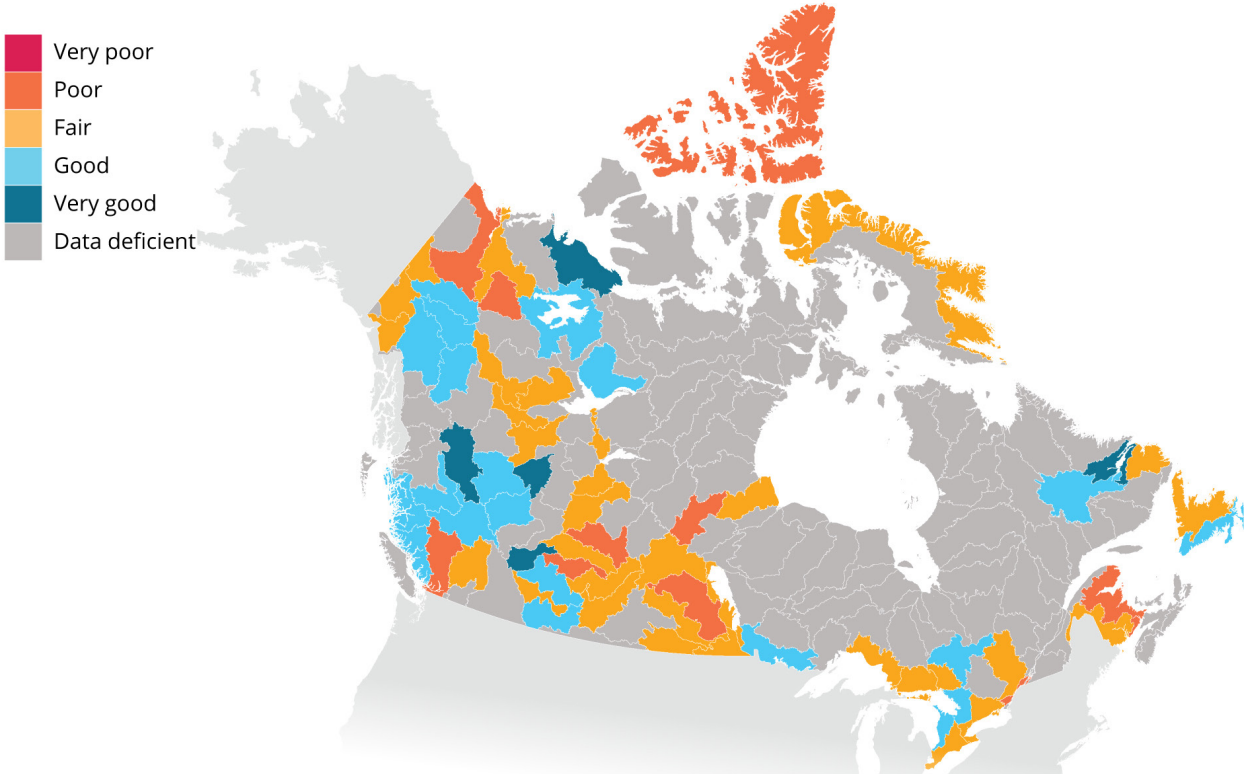
Data deficient

According to WWF's Watershed Reports published in 2017, 100 of 167 Canadian subwatersheds were considered data deficient for water quality. **We don't even know if our waterbodies are healthy or not.**

Our waterways need our help

Many factors contribute to Canada's lack of water quality data, including our physical geography and population distribution, budget cuts and community's technical capacity. Of those with data, 42 of 67 rated 'poor' or 'fair'. **We need to help!**





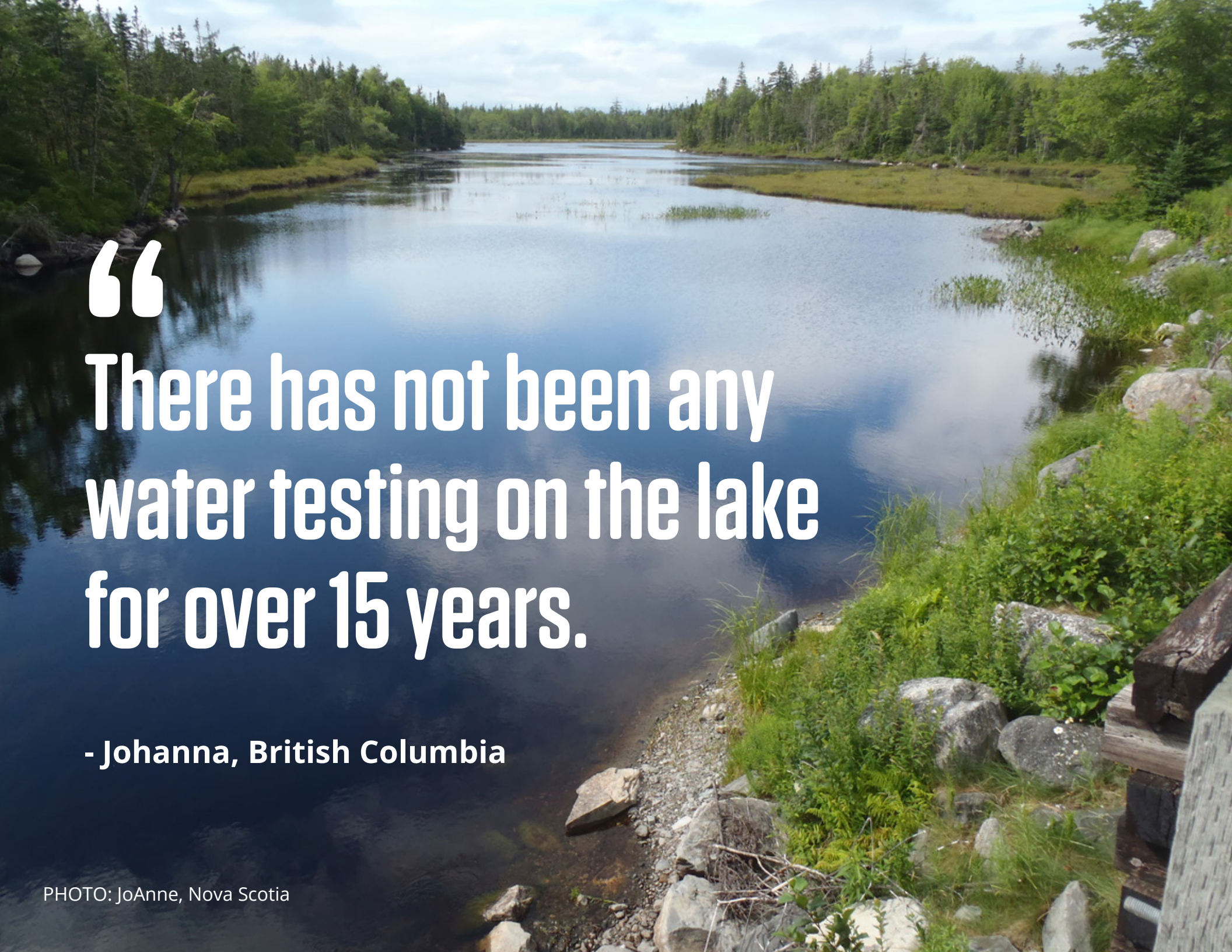


PHOTO: JoAnne, Nova Scotia

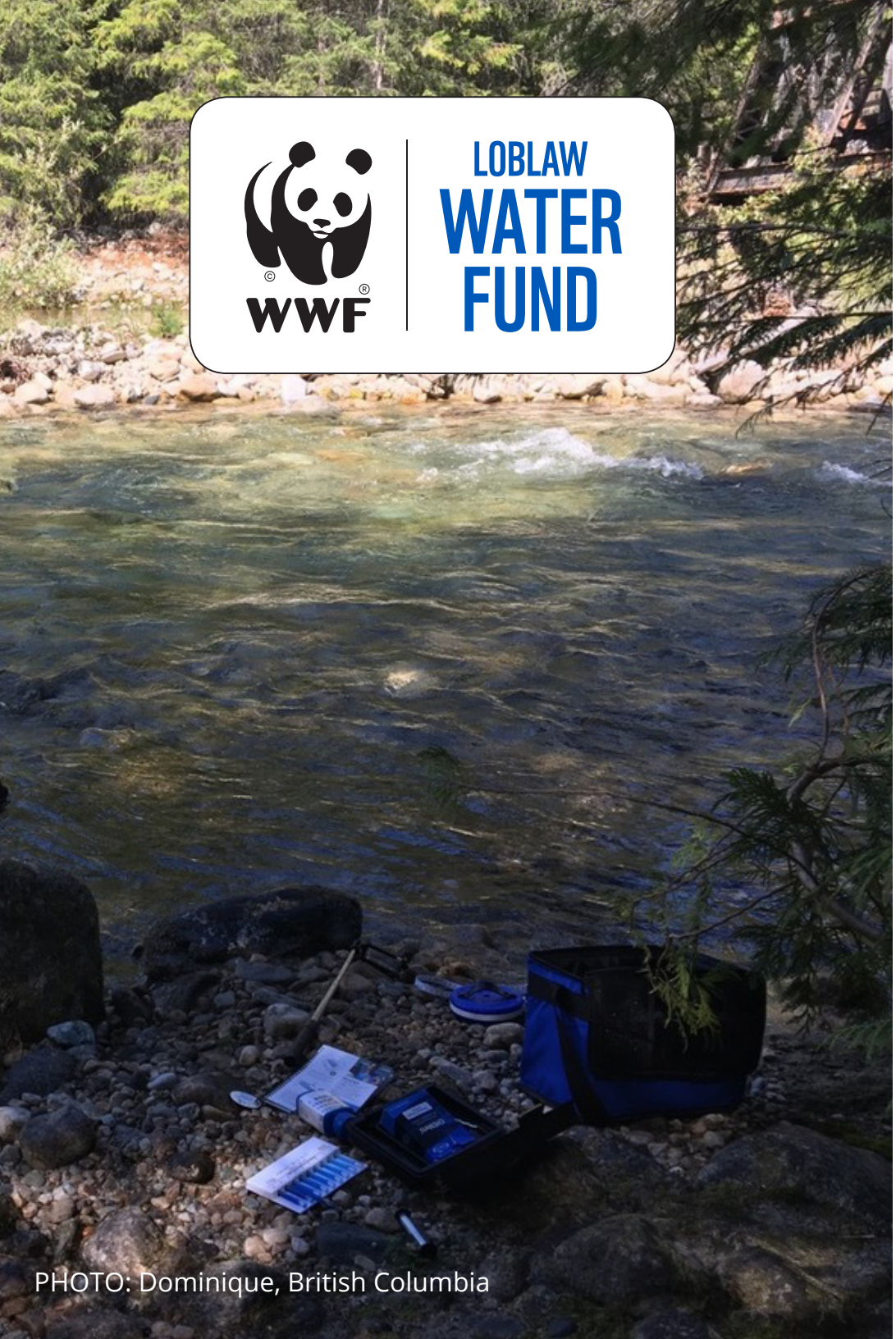


PHOTO: Dominique, British Columbia

The project

Water Rangers had an idea: what if we made it easier for anyone to collect water quality data? Already, we had created a testkit and online platform. But, the idea was to work across Canada, remotely, on a bigger scale.

Twenty-six individuals or groups from across Canada were tasked with testing waterways every month using a simple citizen science testkit. Our hope was that by having fun and building skills using inexpensive water testing equipment, we can begin to build space in communities to fill data gaps and protect waterways. Thanks to the WWF Loblaw Water Fund for making this project possible!

The testkit

Each tester received a testkit. All the tests give you results right away and have been tested for the past 3 years for accuracy and ease-of-use. Tests include: temperature, conductivity, pH, alkalinity, hardness, water clarity and dissolved oxygen. For this project, we updated the bag design to be more user friendly to pack, improved the reel for the secchi disk (water clarity) and redesigned the guide to be more intuitive, with quick links to video tutorials.

We also made sure participants knew they had access to resupplies should they do lots of tests!

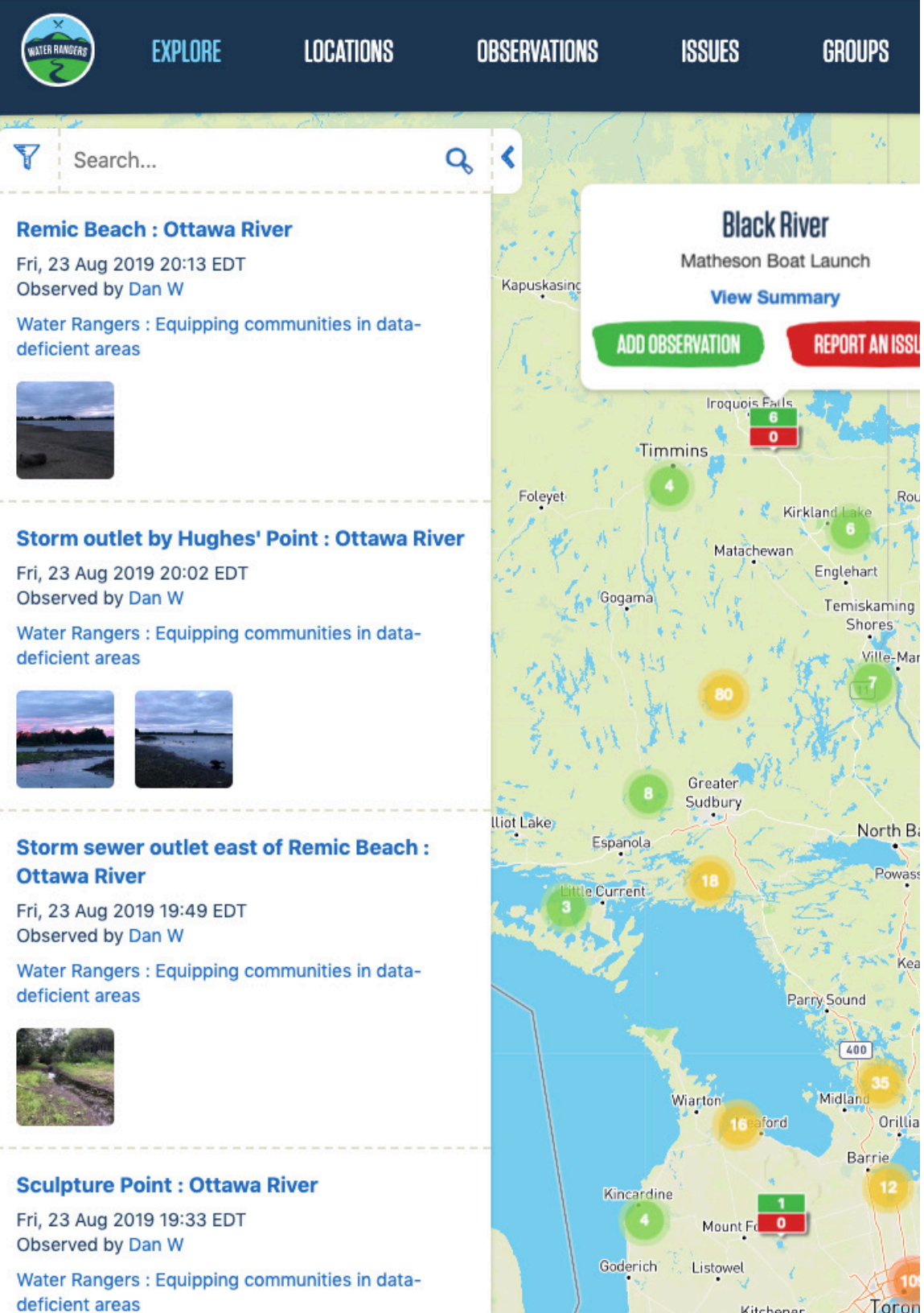
Easy-to-use

Accurate

Affordable

Here come the kits!

PHOTO: Kat's couch



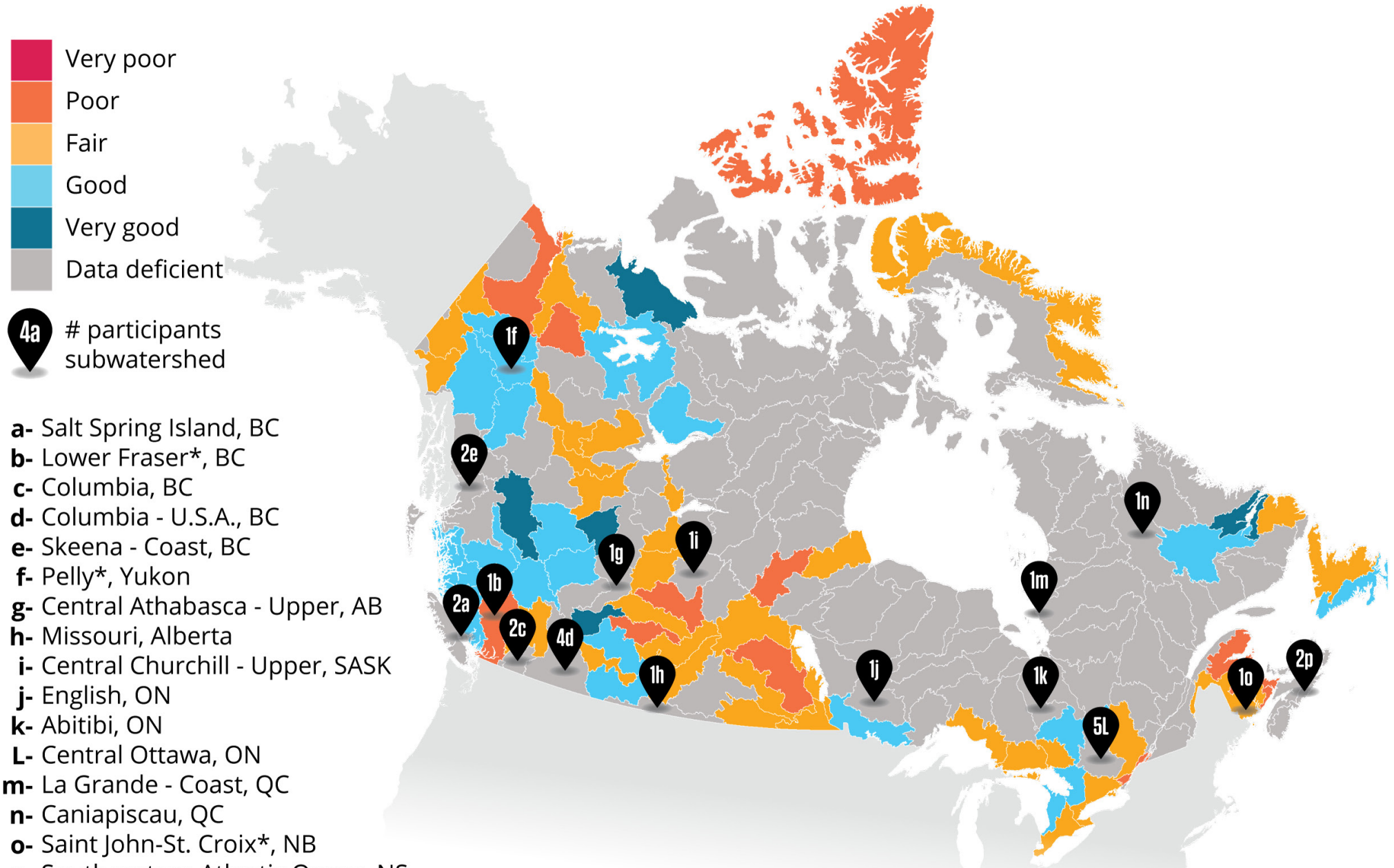
The platform

Everyone attended an online training webinar, and then creating their own profile and recording their observations online at app.waterrangers.ca.

Our team checks every observation as they come in so that we can catch errors early.

Where?

We loved that our participants came from all over Canada! These enthusiastic volunteers were delivered bi-weekly newsletters and helped spread the word through social media.



a- Salt Spring Island, BC
b- Lower Fraser*, BC
c- Columbia, BC
d- Columbia - U.S.A., BC
e- Skeena - Coast, BC
f- Pelly*, Yukon
g- Central Athabasca - Upper, AB
h- Missouri, Alberta
i- Central Churchill - Upper, SASK
j- English, ON
k- Abitibi, ON
L- Central Ottawa, ON
m- La Grande - Coast, QC
n- Caniapiscau, QC
o- Saint John-St. Croix*, NB
p- Southeastern Atlantic Ocean, NS

* While not in data-deficient sub-watersheds, these applications were so good, they scored high enough to be included!

Testing

Everyone was tasked with making 16 observations in 4 locations every month (on the last weekend of the month) starting in June, 2019. The 25 participants who completed our final survey conducted 634 observations in 226 locations, for an average of 25.4 observations (58% higher than goal) at 9 locations (125% higher than goal).

Monthly testing is doable, and over time, will start to give us the baseline data we need to understand if our waterways are healthy. We also know that these new habits will lead to more connection and water stewardship: it was remarkable to hear stories of discovery and enthusiasm over the testing season!

In the following pages, we'll share some results from our surveys, plus insights and stories from those people participating.

25.4

average # of observations
GOAL: 16

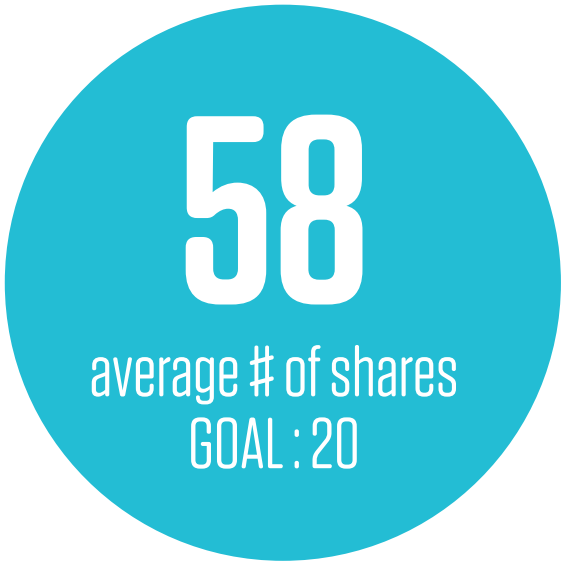
9

Average # of locations
GOAL: 4


79%
...visited new places.
“
I went to a local beach called Malay Falls to test the water and have a swim.
- JoAnne, Nova Scotia
I sampled a spot with difficult access– I would never visited it otherwise.
- Chris, Alberta
PHOTO: Dan, Newfoundland

Sharing

We encouraged participants to become advocates and teachers for waterways (their goal: talk to 20 people and training four in water testing protocols). Participants spoke with more than 1,390 others about the program (average: 58, 190% higher than goal) and taught 224 people how to test (average: 9.3; 132.5% higher than goal). Most had fun stories about their engagement, too!



“

Taught others: 20+ most folks are excited (and a little nervous), though soon realize that it is not that difficult. Emphasis is on repeatability and consistency for the science to be useful. Folks are excited when you tell them as it is all new science and has never been done before (which is true!)

- John, British Columbia

96%

... spoke to others about the protecting the environment

PHOTO: Jacy, Ontario

“

It gives the youth a chance to connect with nature, and provides baseline data for current stream conditions in my area.

-Dominique, British Columbia

88%

...spoke to others about water chemistry or water stewardship.

“I spoke to many people along the way about water testing. Common questions consisted of, why? What type of tests do you conduct? What does it mean (parameters, data, etc).”

- Cristina, Ontario

PHOTO: Dan, Newfoundland

Teaching

The stories from when our volunteers taught others were very exciting: it was through sharing their skills with others that their enthusiasm shone through. Darcie from B.C. even prepared and presented her community's participation as a poster (see next page)!

"The students were able to see the creek fill with stormwater discharging from upstream and measure the spike in conductivity, which was a really neat teaching/learning opportunity!"

- Bianca, Ontario

Nelson Paddling Club: Environmental outreach

Darcie Quamme[1,2], Tess Nutall[2,3], Bailey Stefani[2,4], Brooke Campbell[2] and Marlene Machmer[5]

[1]Integrated Ecological Research, [2]Nelson Paddling Club (NPC) , [3]LVR Highschool, [4]University of Victoria, , [5]Pandion Ecological Research Ltd.

Project Goals:

- Provide education on the values of Kootenay Lake.
- Participate in a National Program to record and use water data in collaboration with Water Rangers and the World Wildlife Fund.
- Engage the community in water science and promote stewardship of Kootenay Lake.
- Provide information to paddlers on the need for Harlequin Duck sightings at paddling events.

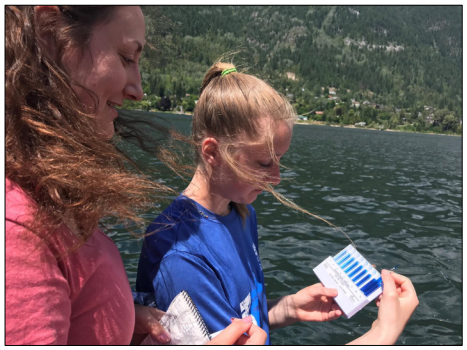
Why is water monitoring important?

To:

- Establish a baseline to assess change
- Contribute to assess waterbodies across Canada
- Start to describe and learn about our lake
- Bring community together to promote stewardship of Kootenay Lake near Nelson, BC

Methods used to test water:

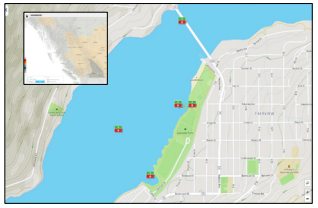
Parameters monitored in monthly sampling included: Temperature, pH, hardness, alkalinity, water clarity, dissolved oxygen using Water Rangers citizen scientist test kits



Outreach

Outreach at the NPC Cardboard Kayak Race re: water monitoring and Harlequin duck citizen science projects.

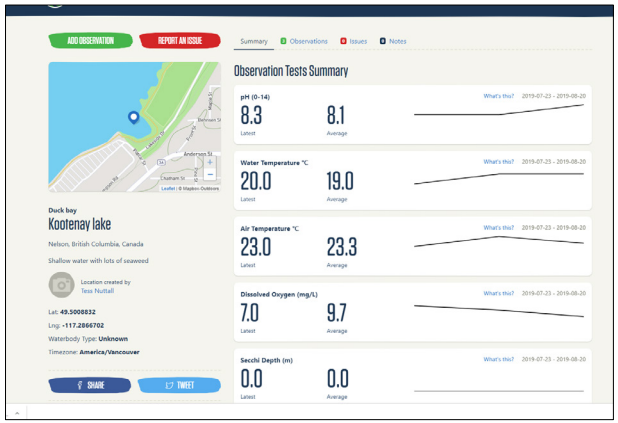
Site locations



WWF watershed report, inset, shows that the Columbia Basin is data deficient. NPC water monitoring sites near Nelson indicated in red.

Accomplishments:

1. Initiated an environmental ambassador program.
2. Professional Biologists, Darcie Quamme and Marlene Machmer, provided training to youth interested in water quality and Harlequin duck citizen science projects.
3. Completed sampling at 4 locations and uploaded to Water Rangers data platform.
4. Successful outreach to Nelson Paddling Club members and community.
5. Information and engagement at the NPC Cardboard Kayak Race reaching over 150 people.
6. Participation in Toadfest which reaches over 200 people at Summit Lake, BC.



Water Rangers platform provides tracking of water quality over time and feeds into WWF project to improve data deficient areas across Canada

Encouraging stewardship of Kootenay Lake and habitats in the West Kootenays

Please contact: Darcie Quamme, Integrated Ecological Research, dlquamme@gmail.com re: water monitoring and Marlene Machmer mmmacher@netidea.com to report Harlequin duck sightings:

Integrated Ecological Research | Pandion Ecological Research Ltd. | NPC | WWF | Water Rangers

Thank you to Water Rangers for providing test kid and online platform for reporting.

Connecting

Everyone was encouraged to connect to organizations, decision-makers and regional data hubs. A few participants then connected Water Rangers to those organizations, with leads to, we hope, better integrated systems for Canada!

PHOTO: Chris, Alberta

“

I’ve connected with several watershed restoration committees, which are helping me take things to the next level (riparian restoration, culvert replacement etc). Also connected with several First Nations communitieas, who have a spiritual connection to water and are leading the way in caring for watersheds (Mi’kmaq Water Walkers & Wabanaki Water Walkers).

- Sarah, New Brunswick

63%

made direct connections in their communities

PHOTO: Water First, Northern Quebec

“

There is Columbia River water monitoring Network that is starting, and they had questions about which quality parameters we are testing.

- Celina, British Columbia

PHOTO: Celina, British Columbia

Promoting

Thanks to WWF (especially Liz, Tina, Heather, Chelsea, Anthony and Dominic) for choosing us to support during a media blitz in Toronto this summer! After publicity with CBC, Radio-Canada, Breakfast TV and others (waterrangers.ca/publicity), various groups contacted Water Rangers. This is only the beginning!

PHOTO: Cassidy Swanston

Building

Our goal is to build the movement towards regular water testing for all waterbodie and help communities start the process. We love that our volunteers took ownership and became advocates for their local waterbodies.

“It is an important project and it gets people interested and involved in their local watercourses or waterbodies. You can learn some new techniques and put them to use to gain a better understanding of your surrounding environment, and meet new people who are interested as well!”

- Mike, Ontario

PHOTO: Nancy, British Columbia

PHOTO: Celina, British Columbia

83%

... believe their actions can make a difference in helping conserve the natural environment.

“The Water Rangers program has renewed interest in water quality testing within our watershed. The program is easy to follow, very relevant to monitoring climate change and the support provided is fantastic! Every watershed could benefit from this program!”

-Joanna, British Columbia

...believe it is important for them to do what they can to preserve the natural environment.

100%

“

It was amazing to me how many really care, but don’t know what to do--or, where to begin.

- Chris, Alberta

PHOTO: Jacy, Ontario

“

This program gave the community a sense that we are proactively protecting the river we love, in case the mine is approved. It has given us confidence that if it is approved, we have baseline data, and can hold industry to a higher standard.

- Sarah, New Brunswick

Areas for improvement

We can always do better! Here's some ideas from our participants.

PHOTO: Dan, Ontario

PHOTO: Water First, Northern Quebec

We love you too.

Running programs like this for the first time is hard work. But, the people you talk to (and their enthusiasm) make everything worth it!

Thanks to all the participants for their kind words (we've shared a couple of them on the next few pages).

“

Water Rangers is a ground breaking program that not only equips communities to actively monitor the health of their waterways, but also serves to raise general awareness about water quality and promotes constructive discussions at the community level. Thanks for all that you do!

- Dan, Ontario

“

Just normal people, those who have never earned a biology degree, can be curious about the world around them. Exploring the water where you live not only gets you outside and engages you in your community, but also inspires you to learn more. Citizen Science works for every age and stage!

-Lee, British Columbia

“

I think Water Rangers is a fantastic program that helps connect people to their environment and allow them to collect meaningful data on aquatic environments while also providing opportunity to engage with and educate others on the benefits as well.

- Chris, Saskatchewan

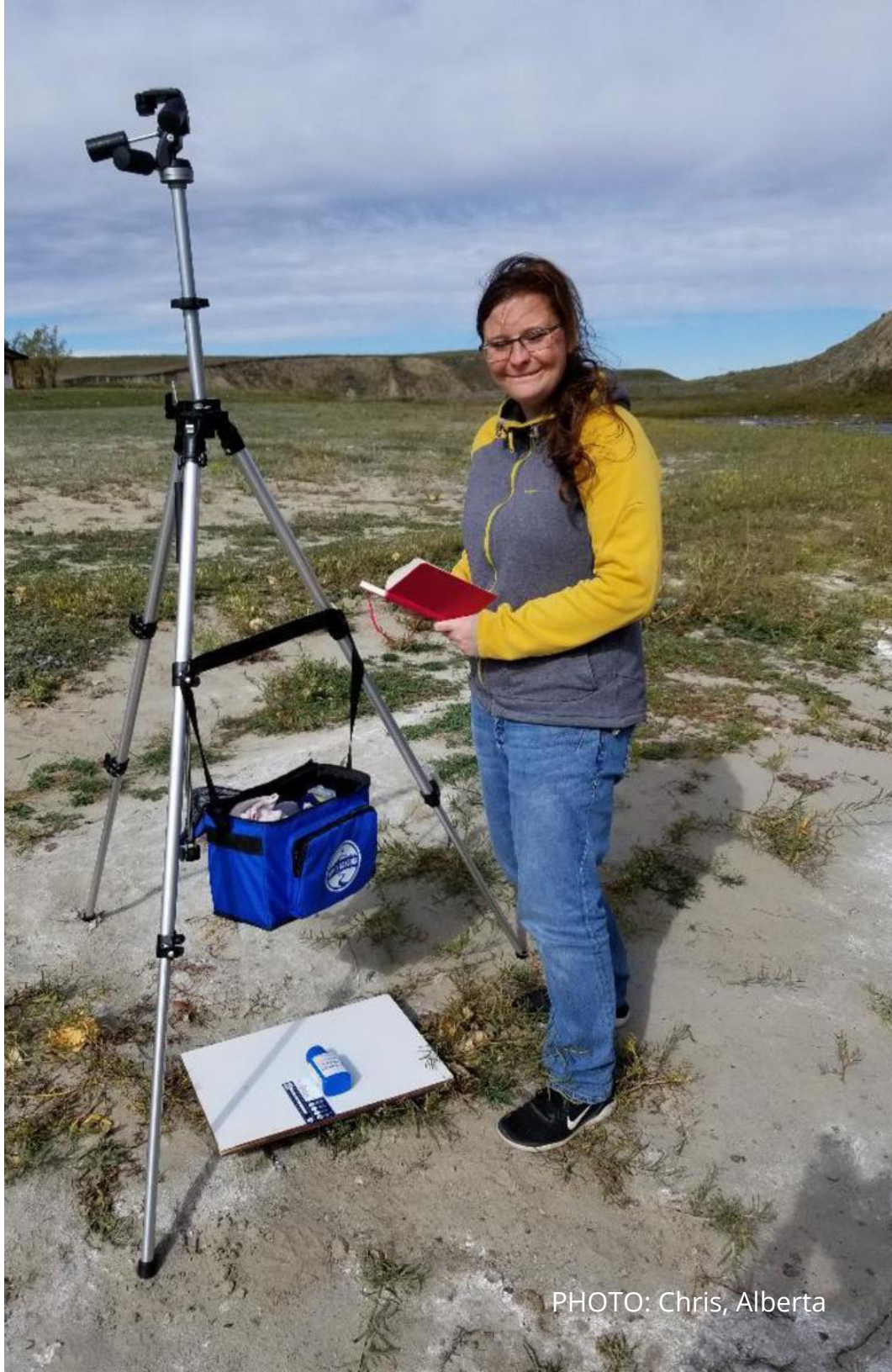


PHOTO: Chris, Alberta

PHOTO: Lee, British Columbia

Final thoughts

Capacity-building and filling data gaps takes time. Tools can help, but they need support, especially to scale. How do we ensure they are self-sustaining?

We're working with partners to use this program as a launch point for bigger impacts in water testing across Canada. We want to build tools that help the community thrive and work with researchers to make sure our data is taken into account.

We're excited about the future, and can't wait for the 2020 testing season to begin!

PHOTO: Wemindji Youth, Quebec

Thank you!

First and foremost, THANK YOU to every one of the volunteers whose enthusiasm and passion made this project such a joy. You give us hope for our great watery country's future.

Special thanks to Najeeba for all her hard work this past summer.

Thank you also to the WWF Loblaw Water Fund for believing in our vision and making it possible!

Questions?

kat@waterrangers.ca