



# TESTKITS WITH ONTARIO 15010

This year, with the help of Ontario150,  
we transformed how people interacted  
with local waterbodies.

# ABOUT WATER RANGERS

Water Rangers is a non-profit organization based in Ottawa aiming to make water science easy to understand. We deepen our impact by providing tools and training to understand, test and protect waterways.

## PLATFORM

We believe that water quality data should be openly available to everyone in a format they can understand. Open data helps the public, students, and politicians learn about water and connect to it. It should be accessible as a common good!

Water Rangers' website and app for mobile devices allow users to collect water quality data and report local water issues such as pollution, and algae blooms.

We design interfaces to display data the average citizen understands, give them digestible lessons, and encourage participation. By understanding water systems, testers see issues and mobilize to make an impact.

## TESTKITS

After developing the platform, people told us that they'd like to test waterways too! But, we were frustrated that testing equipment was expensive, complicated to source, inaccurate and difficult to use.

We've developed easy-to-understand testkits so that citizens can get involved in monitoring waterbodies. As they revisit sites, they understand ecological change, share results, and intervene on emerging issues. According to our survey results, those who test water increase their awareness of the natural world, multiply their time outside, and renew their commitment for protection.

## EDUCATION

Water Rangers envisions a world where water-based research and crowdsourced information make it easy for anyone to understand when water is healthy and when it needs help.

To help inspire people, and to get them to understand water and good testing protocols, we visit the community to train them. All our activities are hands-on and encourage those participating to deepen their understanding by creating hypotheses and testing them.

For those groups with little resources, we apply for grant money to provide this outreach, and teach them how to use our testing equipment.



# OUR HISTORY

Water Rangers' first prototype for water-based citizen science platform won the Ottawa River Aquahacking Challenge in May 2015. Since then, we have used hands-on user testing with scientists and water volunteers to learn the best ways to share information about waterways. Water Rangers was born from our desire to make science understandable and fun.

It is an online platform that facilitates sharing of open data and is currently being used by 62 groups located in eastern Ontario, western Quebec, New Brunswick, Florida and Alabama. We have almost 19,000 observations from different sources, including one indigenous community, three municipalities, eight schools, five conservation authorities and more than a dozen NGOs. This past year we launched our testkit store alongside a grant from Ontario150, and sold over \$9000 worth of kits. We have prototyped our project locally and are ready to make an impact across the country!

# WHY TESTKITS?

THANKS TO ONTARIO150, WE'RE MAKING COLLECTING & VIEWING WATER QUALITY DATA FOR LAKES AND RIVERS ACCESSIBLE & FUN.

Initially, Water Rangers' aim was to make water quality data available and understandable to the general public and give organizations a place to collect data. We soon learned that people were excited about participating, but that they had no access to testing equipment to do it! So, we developed our testkits to be affordable, easy-to-use, require minimal training, safe and accurate.

We believe that low-cost equipment allows more people to deepen their understanding of water issues, and leads to further protection. We believe that crowdsourcing water quality data through citizen science is the only way to achieve sustainable water monitoring. Together with our platform, we can offer people the tools to protect our waters!



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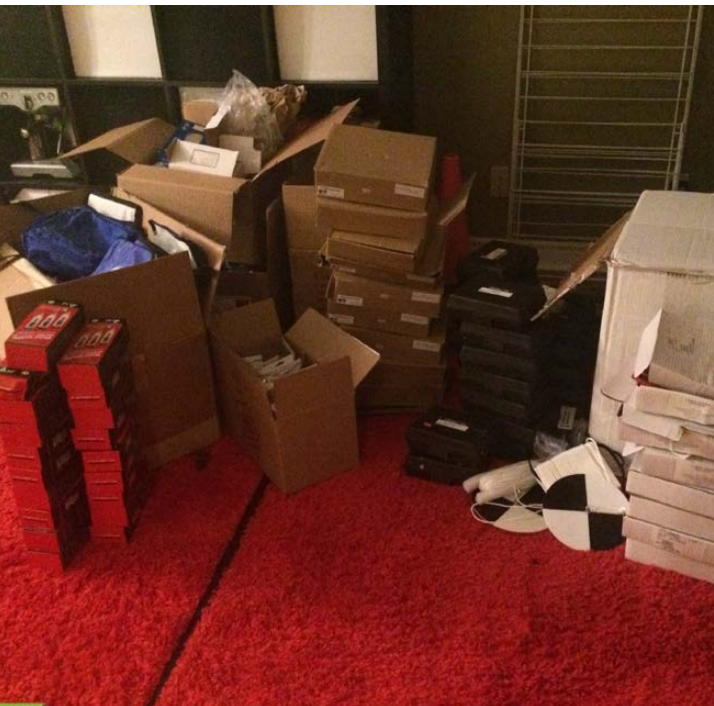
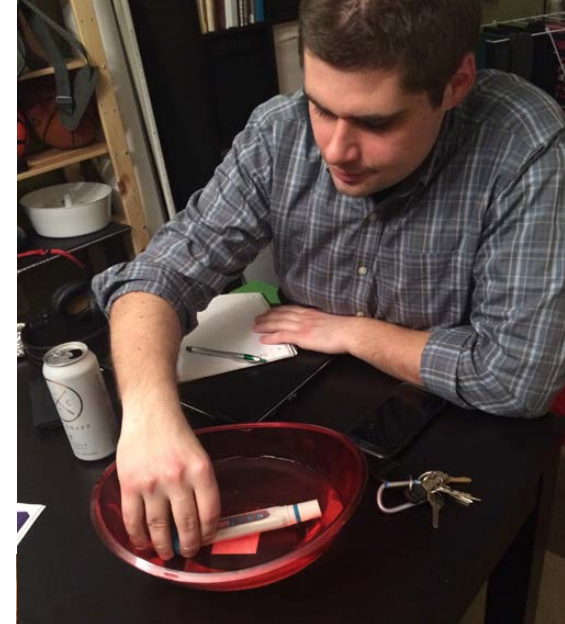
[The testkit] gave me an opportunity to explore lakes and creeks in a way that I was never able to before. It opened my eyes to the possibilities of getting involved to help protect the environment, and it was really interesting to learn about the chemistry and health of different water bodies. It is an incredible feeling to know that you're contributing to protecting water. We had some really great moments together learning about the nature we both love. I cannot wait to learn more.

- Julie Lachapelle

# CREATING THE KITS

Our first prototype in 2016 let us test equipment for accuracy and suitability for community projects. But, we continued the prototyping process throughout this project too. We tested against professional probes, threw items on the ground to test durability and conducted user testing with new people to ensure the best possible learning experiences.

This Fall, we also worked with Carleton University to conduct an academic analysis of our kits' accuracy. Results have been very good and we're ready to make the kit even better in 2018!



# WHAT IS A TESTKIT?

Here's our core Ontario150 "Freshwater Explorer" testkit



**1 Thermometer:** Air temperature, Water temperature \*

**2 Test strips:** pH, Alkalinity and Hardness \*

**3 Conductivity meter:** Conductivity of fresh water + water temperature \*

**4 Secchi disk:** Secchi depth if deep enough, or water depth if in shallow water

**5 ChemMets Test:** Dissolved oxygen

**6 Suspect pollution kit:** Gloves\*, Whirl-Pak bags\*, sterile sample container

**7 Also contains:** Sample cup\*, Phone case\*, Field sheets\*, Pen, Laminated field guide\*,

**8 Selfie stick (for reaching)**

\* The mini kit is a smaller version and contain these items

# WORLD WATER DAY

## MARCH 22, 2017

Organized with Blue Drinks Ottawa, the event aimed to bring together officials with grassroots community efforts. Speakers (shown below) introduced political, scientific and community lessons and then Water Rangers presented how to use the testkits to learn about waterways. Other educational booths included those from Conservation Authorities, Watersheds Canada and more.

110

People joined us at our event at Makerspace North to learn about local issues. Participants in this program received their testkits.

### EVENT SPEAKERS

**David Chernushenko**  
Ottawa City Councillor

**Barbara King**  
Executive Director of Watersheds Canadian

**Meera Karunanathan,**  
Blue Planet Project  
The Council of Canadians

**Meaghan Murphy**  
Ottawa Riverkeeper  
Staff Scientist

**Kat Kavanagh**  
Executive Director of Water Rangers

The World Water Day event was just the first part of our volunteers' journey. We introduced the kits and how they worked. Each group received a field guide, access to a how-to video and regular emails to help them make a testing plan. By getting a testkit, they were promising to test waterways regularly over the spring, summer and fall.





# WHO?

- Focused on one water body
- Other organizations / groups
- Individuals
- ☆ Want to continue next year

These groups are committed to protecting waterways. They signed up their groups to receive a testkit. Overall, at least one group also identified as multicultural, LGBTQ+, youth, seniors, persons with disabilities, Indigenous Peoples, and Francophone communities.

**24**  
Testkits  
TARGET: 17

**1600**  
community members  
represented by these  
groups.



# WHERE?

77

Water bodies

286

Sampling sites

TARGET: 150

810

Observations

TARGET: 750

## LAKES

Bass Lake  
Big Gull Lake\*  
Calabogie Lake  
Canisby Lake  
Collins Lake\*  
Colonel By Lake  
Lake Couchiching  
Dows Lake\*  
Lake Dore  
Lake Erie\*  
Elbow Lake  
Glendalough Lake  
Golden Lake  
Gull Lake  
Lake on the Mountain  
Larder Lake  
Little Lake Clear  
Lower Rock Lake  
Lake Mazinaw\*  
Mississippi Lake\*

Moira Lake  
Mud Lake  
Muskrat Lake\*  
Lake Ontario\*  
Orr Lake  
Oxtongue Lake  
Round Lake  
Sand Lake  
Scully Lake\*  
Sharbot Lake\*  
Lake Simcoe  
Silver Lake  
Sington Lake  
Smoke Lake  
Lake Scugog\*  
Lake Sesekinika  
Lake Temagami  
White Lake\*  
Upper Rock Lake  
Varty Lake

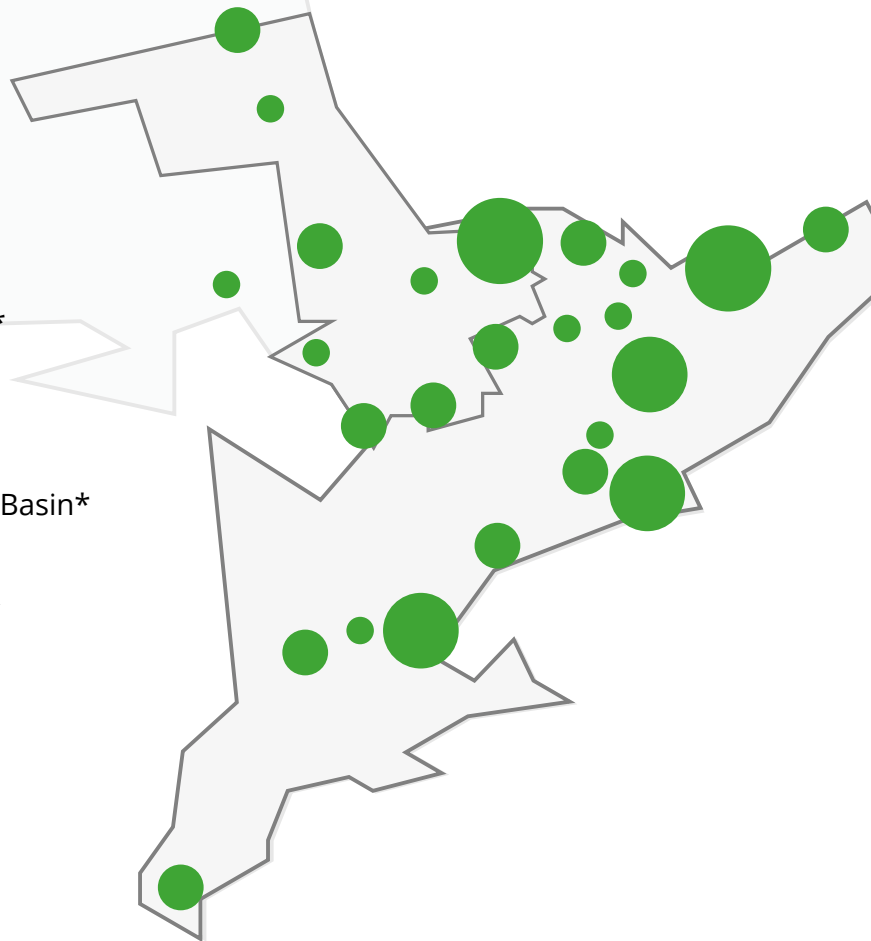
## RIVERS

Black River  
Bonnechere River  
Carp River  
Cataraqui River  
Ganaraska River  
Grand River  
Indian River  
Jock River\*  
Madawaska River\*  
Mississippi River  
Muskeg River  
Napanee River\*  
Nonquon River  
Nottawasaga River  
Ottawa River\*  
Rideau River\*  
Saugeen River  
Snake River  
York River


## OTHER

Brewer Park Pond  
Code Creek  
Etobicoke Creek  
Georgian Bay\*  
Greens Creek\*  
Hamilton Brook  
Hog's Back Falls  
Hurd's Creek  
Laurel Creek  
McGibbon Creek\*  
McIntyre Creek  
McKay Creek  
Mink Creek\*  
Monaghan Drain Basin\*  
Nepean Creek  
Patterson's Creek  
Sawmill Creek  
Watt's Creek\*

\* Water body has multiple sample sites



# LESSONS LEARNED



## FOLLOW-UP

Keeping everyone on track and doing what they were supposed to do required time and effort. Because we remained in contact with testers and monitored incoming observations, we were able to redirect a few kits to new groups. We've also received so many new ideas on how to improve for next year!

## OPEN

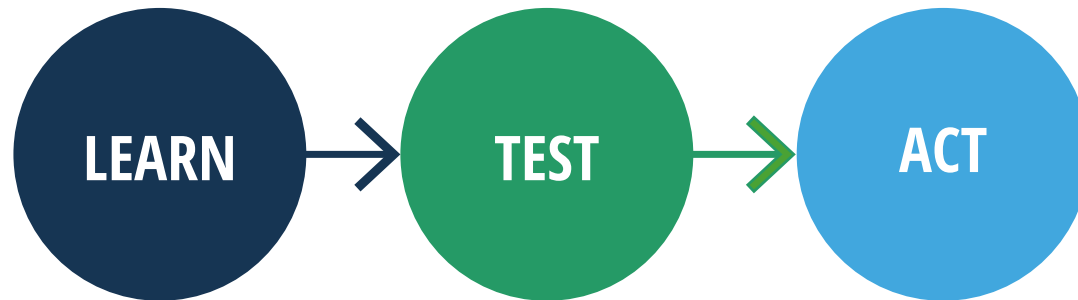
We had so many people interested in the kits that we used extra supplies to set up a 'lending program'. We also organized bi-weekly sessions at local beaches so that interested citizens could come learn what it was all about.

## PLANNING

Many of our users needed more guidance on how to test, how to engage with their communities, and how to create a test plan. This year, we were able to support them, and we'll create resources we can share on our website going forward.

# HOW WE MEASURE IMPACT

Our theory of change says that when people learn about, and then test water, they are prompted to act to protect waterways.



**1.1k+**

People trained (including over 750 students) in 2017. Less than 15% had tested the water before.

**810**

Observations made at over 286 locations with our testkits in 2017

**96%**

of those who tested the water participated in other activities to protect water

# IN THEIR OWN WORDS

“

**The testing has influenced me to look deeper into the health of our watershed and how chemistry plays an integral part in determining what “lies beneath the surface.”**

- Lawrence O'Keefe  
Friends of the Napanee

“

**This program allowed us to become more familiar with the metrics used to measure the health of our river. It complemented other sources of knowledge gained through citizen use. Two adults, four youth, and one child participated, and each time we tested, the youth were met with inquiry from the public to which they happily engaged. We showed a newcomer family that happened to be fishing from the shoreline how to use the kit. Their childrens' curiosity resulted in a boat ride to make observations with us that day. Engaging others was a highlight for our children.**

- The Crouchman Family



# DO TESTKITS CHANGE BEHAVIOUR?



Shared their knowledge with curious bystanders, including 85% who taught others about water chemistry or water stewardship.

90%

Said that the tests helped them understand their lake or river.

92%

Found the testkits easy to use and 85% said we helped them be better water stewards.

“

The main takeaway for me is the importance of simply involving people in water quality testing. Most important is engaging youth who will be the eventual stewards of our natural environment.

- Conrad Gregoire  
Retired Chemist,  
White Lake

# ONTARIO150 TESTKIT SURVEY RESULTS LEADS TO ACTION!



I loved doing the testing, as I was a Chemistry student back awhile. I love to do things that will help the environment. I would be interested in our lakes and their results in Ontario and Canada.

- Virginia and Ken Grant, Big Gull Lake East end Cottage Association

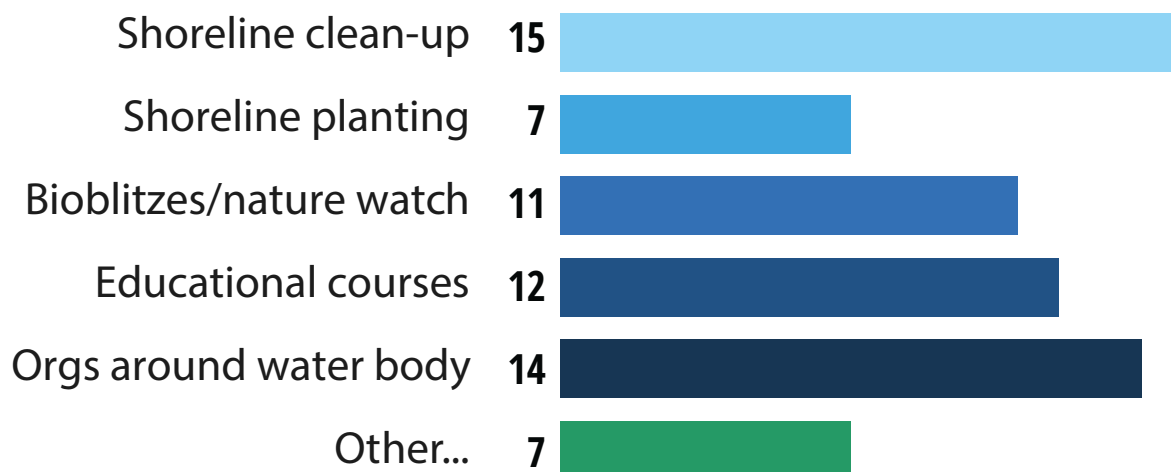


Participated in at least one other action that protects waterways while part of this program

74%

Visited the water more often because of this program.

## WHAT THEY DID



66%

Tested in locations they had never visited before.

94%

Believe their actions can make a difference.



# TEACHING KIDS!

We used the kits as a way to engage with local youth and fits well into Grade 8 curriculum. Our team plus our volunteers taught hundreds of kids this year using the kits. Kids learned to use their senses and apply the scientific method in the field. Here are just a few photos.



# VOLUNTEERS

Our users and primary team all act as volunteers. Whenever we can, we cover expenses, and provide some compensation for our core workers. University and college students volunteer for us to help them get practical experience. We try to be fair and appreciative to our volunteers. For example, we have testkit-making 'parties' where we provide lunch, and yearly 'thank-you' year end parties to bring together those who believe in this movement. Here's some pictures of our favourite people!





## “ DEEPENING CONNECTION

I visited places I would normally just pass by. I feel more connected with the areas that I sample at because I am actively observing my surroundings and reading the test results. I know what the qualities of the water are.

-Julie Sell, Algonquin student



## “ CREATING COMMUNITY

I realized through Water Rangers that there is whole community of folks who care about their local watersheds and want to be involved in protecting them for the future. That citizen science is fun and accessible to everyone.

- Cale, Protect our Waters



# ONTARIO 150

We've celebrated Canada's birthday by appreciating and monitoring our most precious resource: Water. Without the support of Ontario150, this transformation and movement towards protecting waterways would not be possible.

People are excited about testing waterways, and this program was a jumpstart. Thank you to all the volunteers that believed in this ambitious project! Now, we will continue supporting our volunteers to make sure the next generation understands and loves waterways so we can protect them.



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THANK YOU!

Please contact [kat@waterrangers.ca](mailto:kat@waterrangers.ca) if you have any questions

