

Photo: Abbey Neville



# Kat Kavanagh







Follow @waterwatchers

High PH values found near Lac McGregor  
<http://11.com>  
 date time

Animals, fish found just north of Gatineau park  
 Link link  
 date time

Bank erosion found near cutting x caused by cutting down trees.  
 date time Link link



Kat Kavanagh 23 Feb 2015

PH  
**7.2**  
 01.15.15 normal

**7.9**  
 average High

MORE

About

Settings

ON

Notify me of events within  of my current location

Notify me when others add data to my observations

Water Temperature  
**16°C**  
 03.28.15  
 Warm enough for swimming

Phosphates mg/L  
**0.15**  
 03.15.15 HIGH

0.02 average normal

Concentrations over 0.05 mg/L affect river conditions.

Water Clarity (turbidity)  
**4.2**  
 01.05.2015 Clear

3.2 Avg intermediate

Export

find...



Water clarity  
 mg/L  
**0.5**  
 average

Fecal coliforms/100ml  
**56**  
 average

over 120 are not drinking. Levels 35 are not safe for drinking.



Reports

Algae increase in bay  
 Name name

Add Observation

Current location  
 Location name (NICKNAME)

Data recorded on

Add Photo

Check all that apply

Mammal  Reptile  
 Amphibians  Fish  
 Insects  Birds  Plants

Changes in conditions

Foam  
 Red plumes

Comments

Do you have a test kit?

Test Data

Are you a researcher?

Add Research

Add observations



NITRITES

< 0.5 mg/L  
 no effect on warm water fish  
 nitrite minimum for salmon 0.06 mg/L





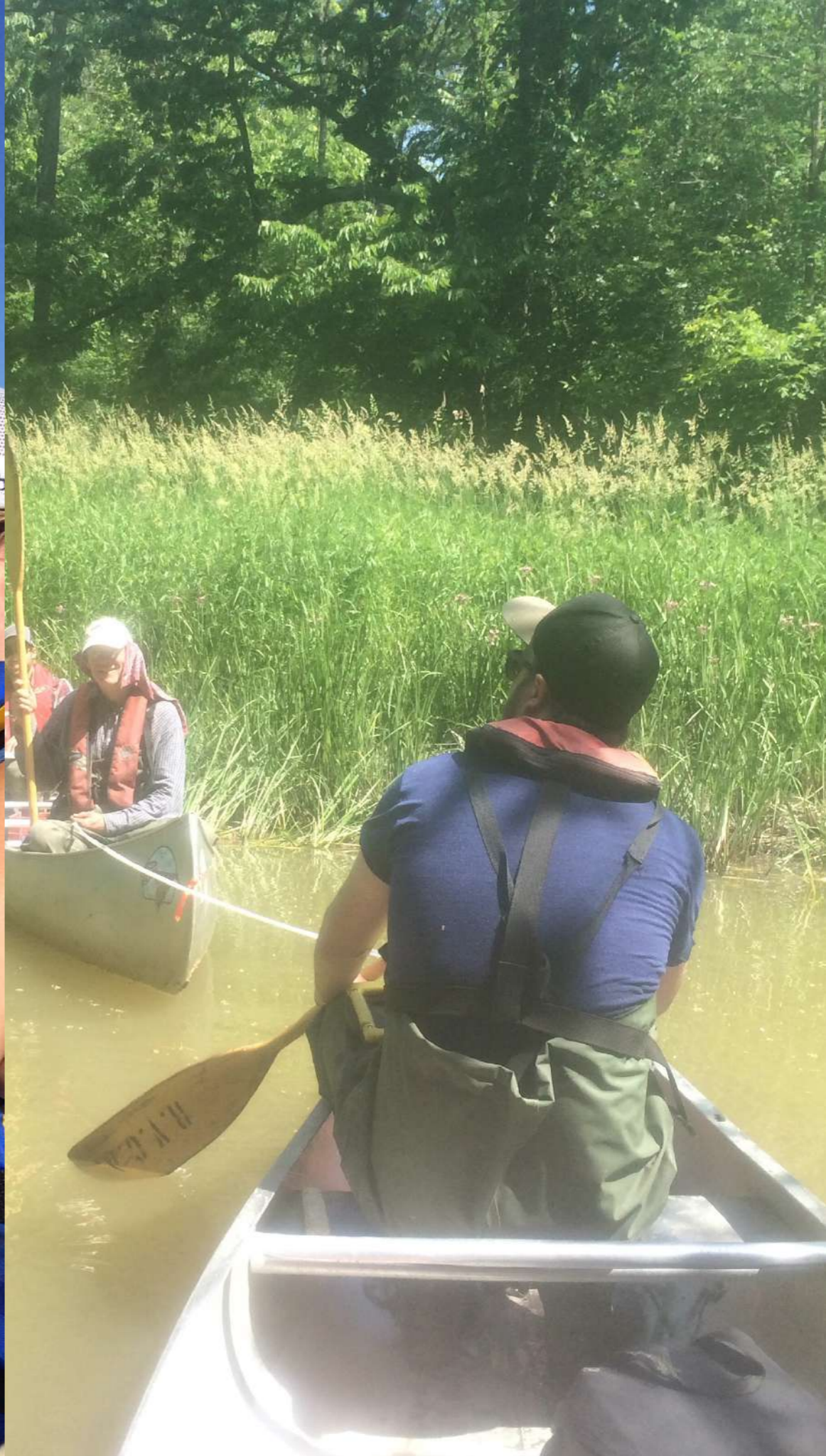
WHO ARE THE  
RIVER RANGERS?

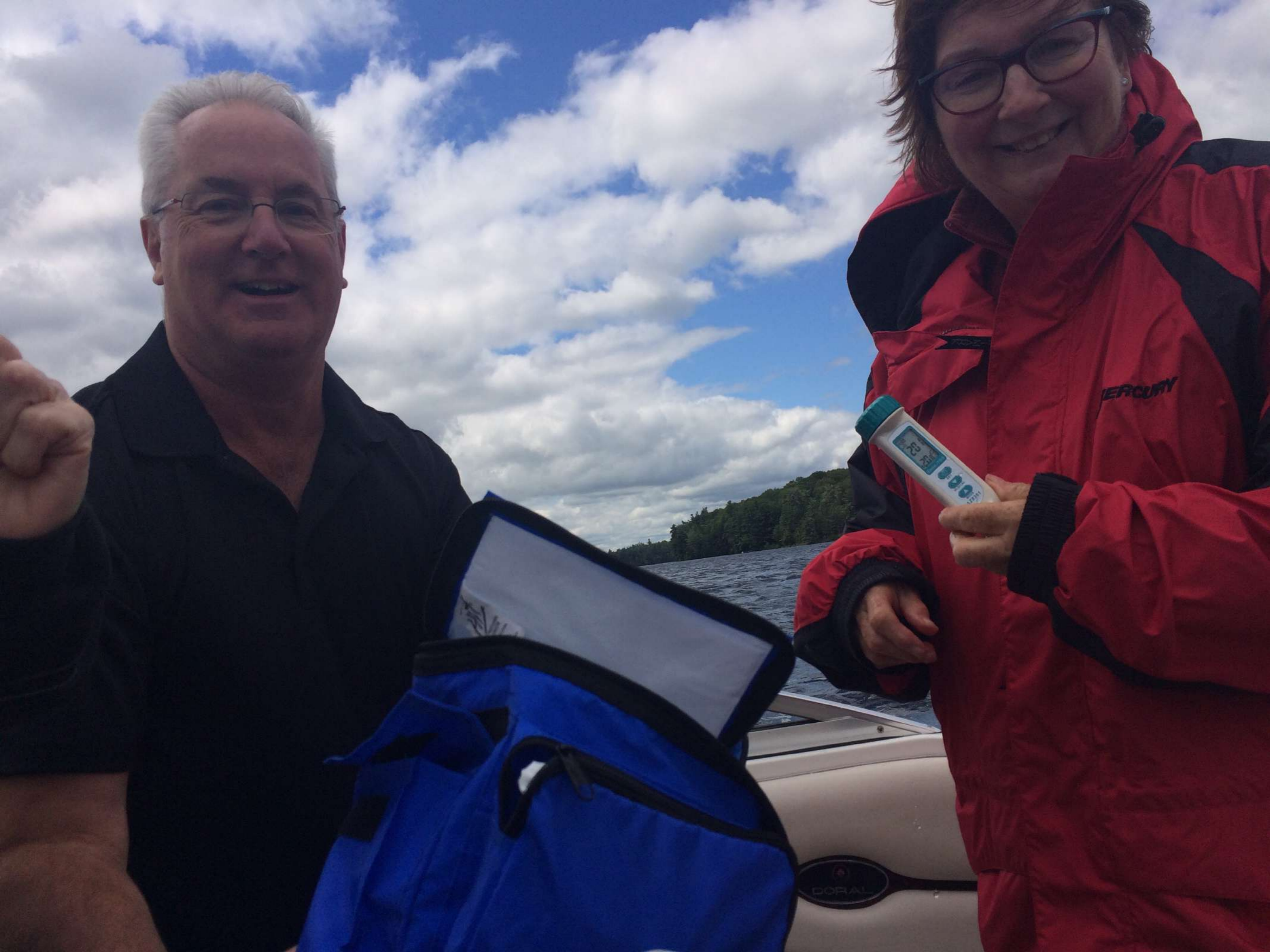
A Passionate about the



**AQUA HACKING**

SOMMET DE LA RIVIÈRE DES OUTAOUAIS / 2015  
OTTAWA RIVER SUMMIT

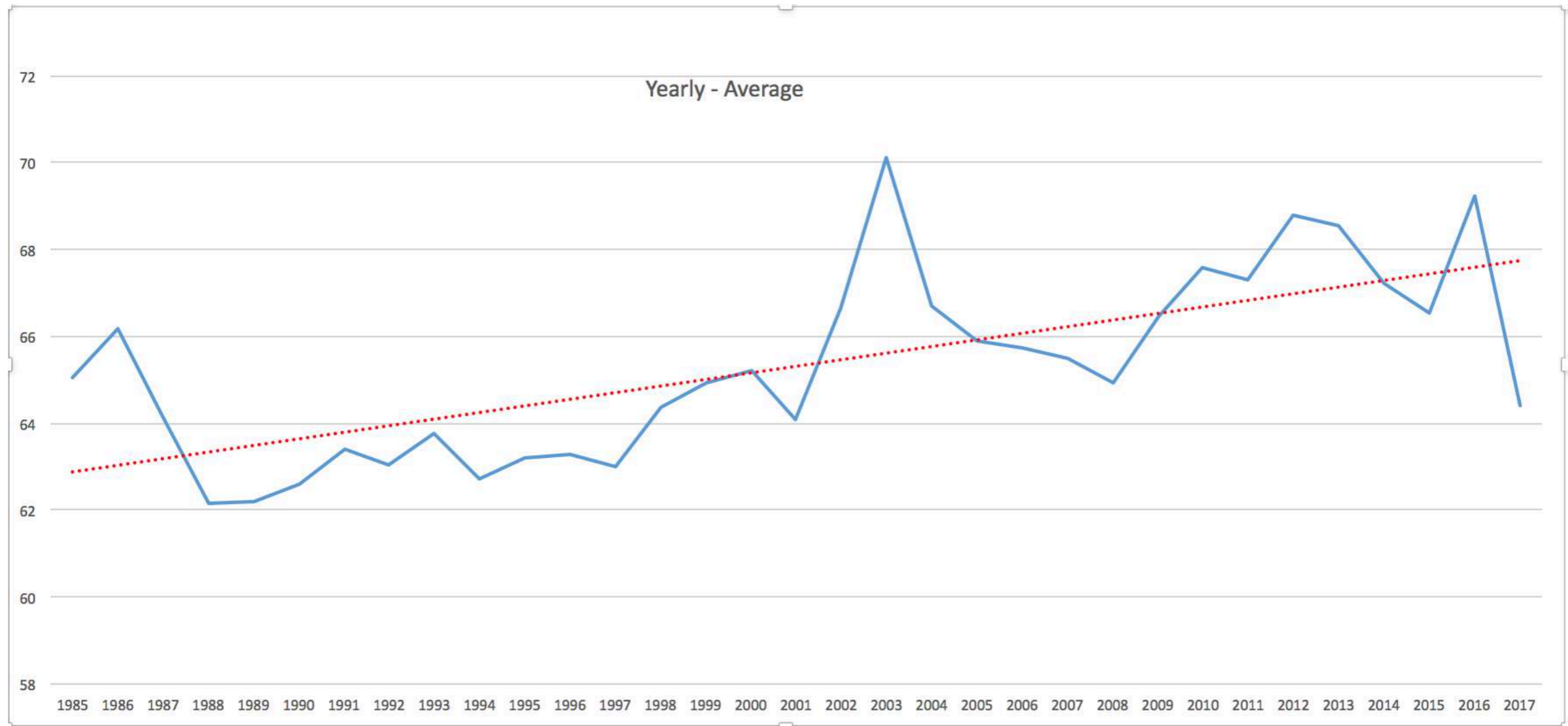






**Notes: to maintain consistency of results**

Attempt to measure between 7:00-8:00 a.m.	Same time
Targeted Monday's (But sometimes Tuesday)	Same Day
Have 2 thermometers. Pool quality.	Same type
Bring thermometers in each winter	No extremes
Units hung 1 meter below surface. Out of direct sun	Same place
Place 32 feet from shore.	Same Location





Search...

Little Lake /fish sanctuary : Big Rideau

Mon, 08 Jul 2019 16:10 EDT  
Observed by Doris Albert

Big Rideau Lake Association : Big Rideau Lake Water Quality



Outlet to Silver Lake Creek at Silver Lake Provincial Park : Silver Lake

Mon, 08 Jul 2019 13:18 EDT  
Observed by Greg Ellis

Water Rangers : Testers

Up stream of Brittania beach : Ottawa river

Mon, 08 Jul 2019 10:22 EDT  
Observed by Ryan Hiemstra

Water Rangers : Equipping communities in data-deficient areas

NorthEast Quadrant of Silver Lake : Silver Lake

Mon, 08 Jul 2019 07:41 EDT  
Observed by Greg Ellis

Water Rangers : Testers



**Nelson River**  
Bipole III Converter Station

[View Summary](#)

[ADD OBSERVATION](#) [REPORT](#)

1
0

Easy-to-use

Flexible

Useful

[ADD OBSERVATION](#)[REPORT AN ISSUE](#)[Summary](#)[36 Observations](#)[0 Issues](#)[21 Notes](#)

## Observation Tests Summary

**Water Temperature °C**[What's this?](#) 2016-04-27 - 2019-05-07**7.0**

Latest

**17.9**

Average

**Dissolved Oxygen (mg/L)**[What's this?](#) 2016-08-23 - 2019-05-07**7.0**

Latest

**8.2**

Average

**Secchi Depth (m)**[What's this?](#) 2016-04-27 - 2019-05-07**4.3**

Latest

**6.4**

Average

**Conductivity (uS/cm)**[What's this?](#) 2016-06-19 - 2019-05-07**74**

Latest

**88**

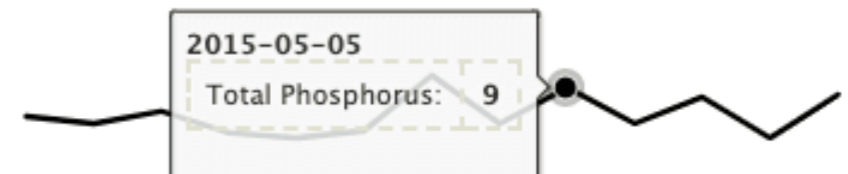
Average

**Total Phosphorus (µg/L)**[What's this?](#) 2003-05-16 - 2019-05-07**8.0**

Latest

**5.2**

Average



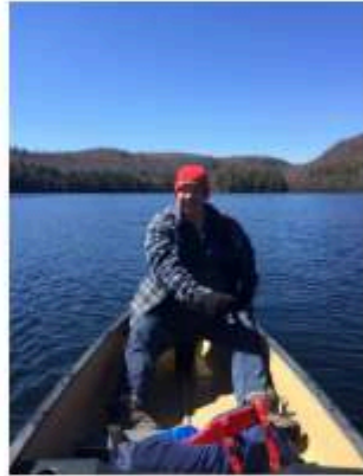
2015-05-05  
Total Phosphorus: 9

**Center of Lake McGlashan, deepest point**

# Lac McGlashan

Val Des Monts, Quebec, Canada

Location created by [Bob Neville](#)Lat: **45.6492998**Lng: **-75.7433**Waterbody Type: **Unknown**Timezone: **America/Toronto**[Download Data](#)



### Fédération des Lacs de Val-des-Monts Lac McGlashan et Girard

Manage Group

61

Observations

1

Issues

4

Locations

### Leaderboard

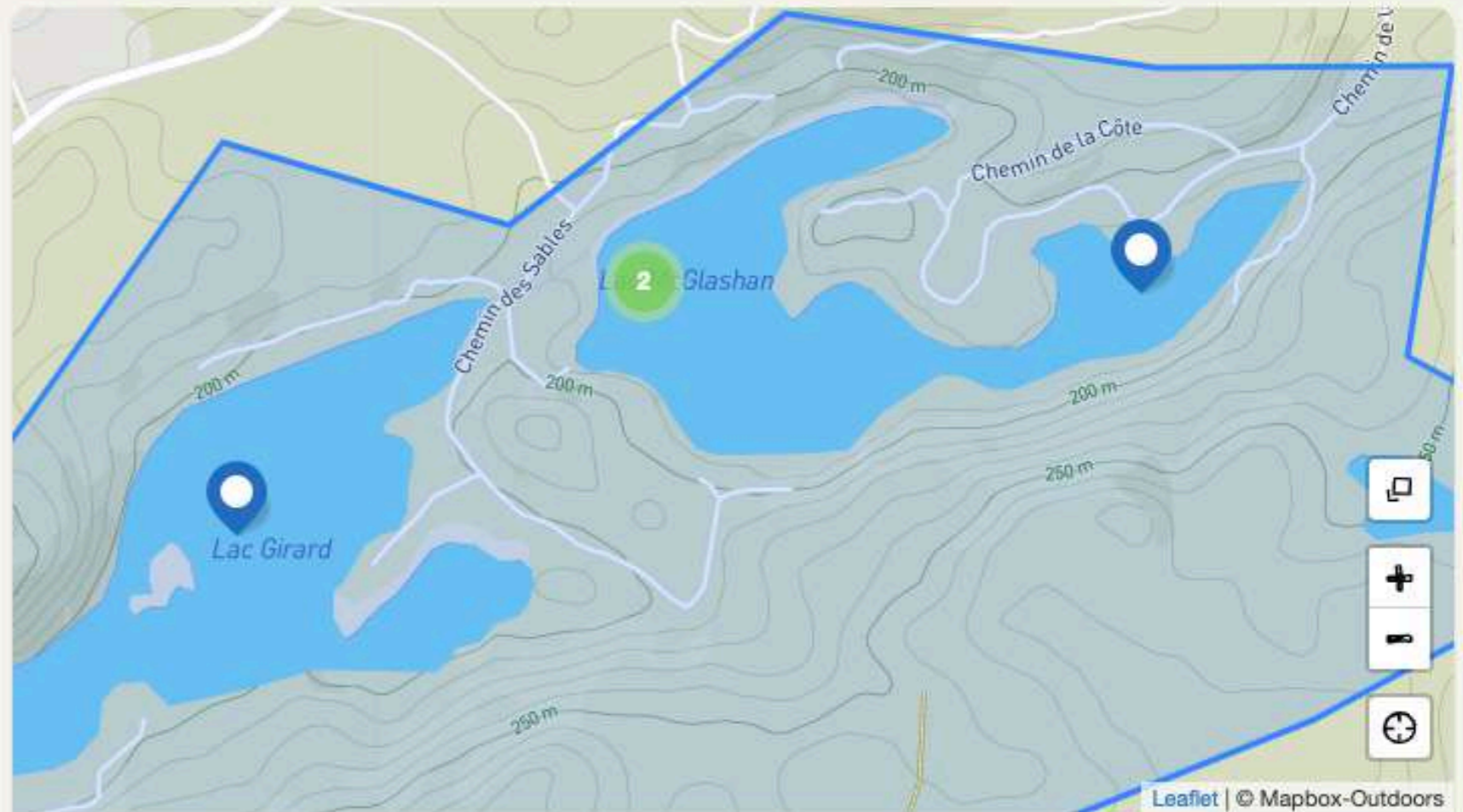


**Kat Kavanagh**  
3950 Points

Locations & Observations

About

Members



Leaflet | © Mapbox-Outdoors

Locations	Last observation made	
Lac Girard : Center of the lake, deepest point	2019-05-07 13:50 EDT	17 of 19 Observations
Lac McGlashan : Center of Lake McGlashan, deepest point	2019-05-05 10:00 EDT	24 of 36 Observations
Lac McGlashan : Near the stream that comes from Lac Girard	2019-05-25 17:15 EDT	16 of 45 Observations

# Group Admin

**Fédération des Lacs de Val-des-Monts : Lac McGlashan et Girard**

[Details](#)

[Members](#)

[Observation Form](#)

[Region](#)

[Settings](#)

[Reports](#)

## Edit Custom Form

Check the items which you would like to be displayed on the observation form for this group. Any categories that are unchecked, will not be visible!

- Wildlife
- Invasive Species
- Ice Watch
- Sample ID
- Testers
- Weather
- Water Quality Tests

We show all Water Tests by default. To create a customized set of tests for the group, drag the fields you want from the available list. You can also choose to record multiple samples.

### Available Water Tests

Optional tests that are available

- Calcium (ppm)**  
What's this?
- Chloride (ppm)**  
What's this?
- Chlorophyll A (µg/L)**  
What's this?
- E.coli per 100mL**  
What's this?
- Enterococci per 100mL**  
What's this?
- Phosphates total (ppm)**  
What's this?
- Salinity (ppt)**  
What's this?

### Group Water Tests

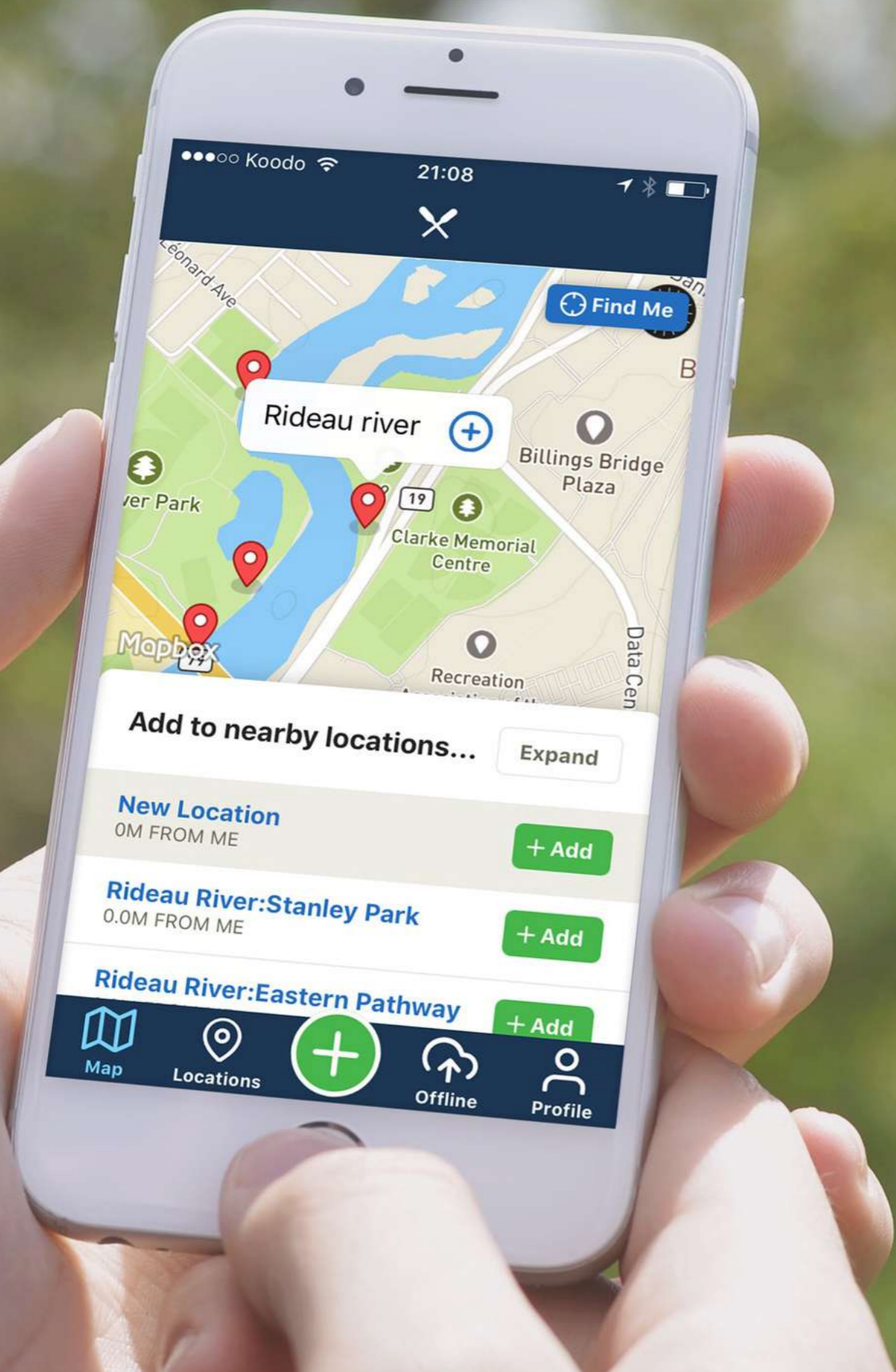
Primary tests performed

- Air Temperature °C**  
What's this?
- Water Temperature °C**  
What's this?
- Chlorine (ppm)**  
What's this?
- pH (0-14)**  
What's this?
- Alkalinity (ma/L)**  
What's this?

### Unlisted Water Tests

Tests will not be listed on Observation Form

- River Flow (cfs)**  
What's this?



Koodo 21:08



Find Me

Rideau river



Billings Bridge Plaza

Clarke Memorial Centre

ver Park

Mapbox

Recreation

Data Cen

Add to nearby locations... Expand

New Location  
0.0M FROM ME + Add

Rideau River:Stanley Park  
0.0M FROM ME + Add

Rideau River:Eastern Pathway + Add



Map



Locations



Offline



Profile



North Face  
COLLEGE



BEACHKEEPER  
GARDE-PLAGE



# Water tests

## Learn about water chemistry

Each team gets a water quality testkit from [Water Rangers](#), and they can use the iOS app to collect data in the field and the online platform to track how water quality changes over time. Kits can include equipment to test air temperature, water temperature, pH, hardness, alkalinity, and conductivity.

[See the testkit](#)

## Latest Observations

from [Water Rangers](#)

### [Deschênes Rapids Ruins : Ottawa River](#)

AUGUST 14TH 2017, 11:00:00 AM

[Stibbe Family](#)

### [Petrie Island : Ottawa River](#)

AUGUST 3RD 2017, 3:54:00 PM

[Emily Daze](#)

### [Friends of Petrie Island Beach : Ottawa River](#)

JULY 25TH 2017, 3:30:00 PM

[Emily Daze](#)

### [Camp Woolsey Beach : Ottawa River](#)

JUNE 17TH 2017, 9:35:00 AM

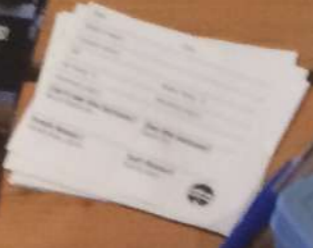
[Kathleen Murr](#)

### [Watt's Creek Pond](#)

JUNE 15TH 2017, 2:10:00 PM

[Maryse Godin](#)









Easy-to-use

Accurate

Affordable





# WHO?

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, LGTBQ+, youth, seniors, persons with disabilities, Indigenous Peoples, and Francophone communities.

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





**24**  
Testkits  
TARGET: 17

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



# Who?

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

-  Lake/River association
-  Other organizations / groups
-  Individuals
-  Want to continue next year



26

Testkits  
TARGET: 25

114

Participants at 11 events

TARGET: 50 participants







Search...

### Loch Leven

Fri, 25 Oct 2019 13:40 CST  
Observed by Nancy Dobson

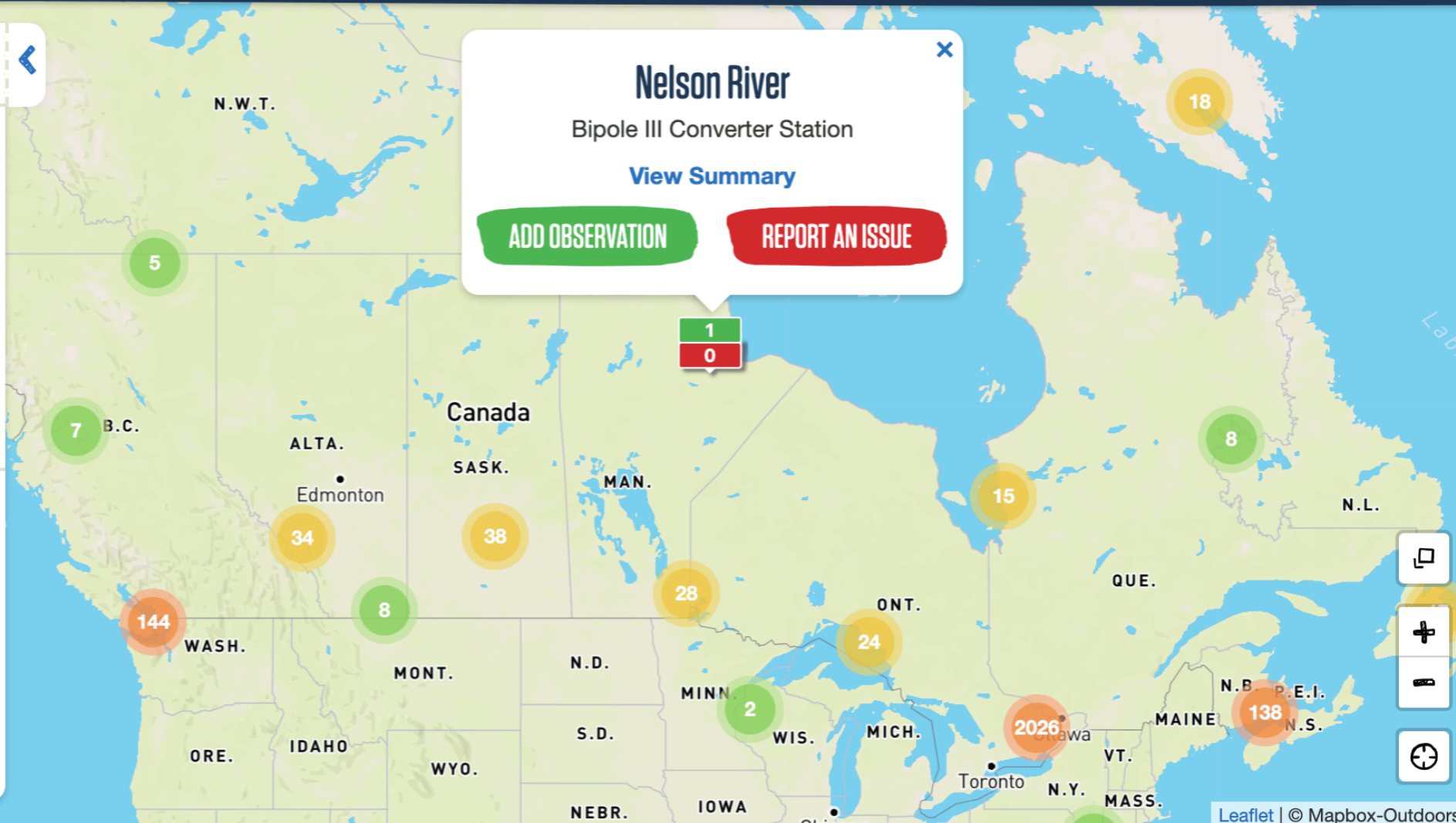
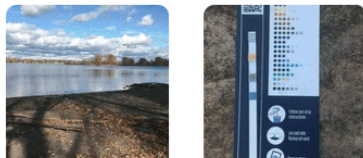
University of Regina : Citizen Science



### Blair boat launch : Ottawa River

Fri, 25 Oct 2019 13:01 EDT  
Observed by Alex Gazaleh

Water Rangers : Test strip reading study





# Conrad Gregoire!

Temperature

pH

Conductivity

Dissolved oxygen



Affordable?  
Varied- U.S.A

Easy-to-use?

Accurate?

DANGEROUS! Difficult to reach



# Phosphate testing:

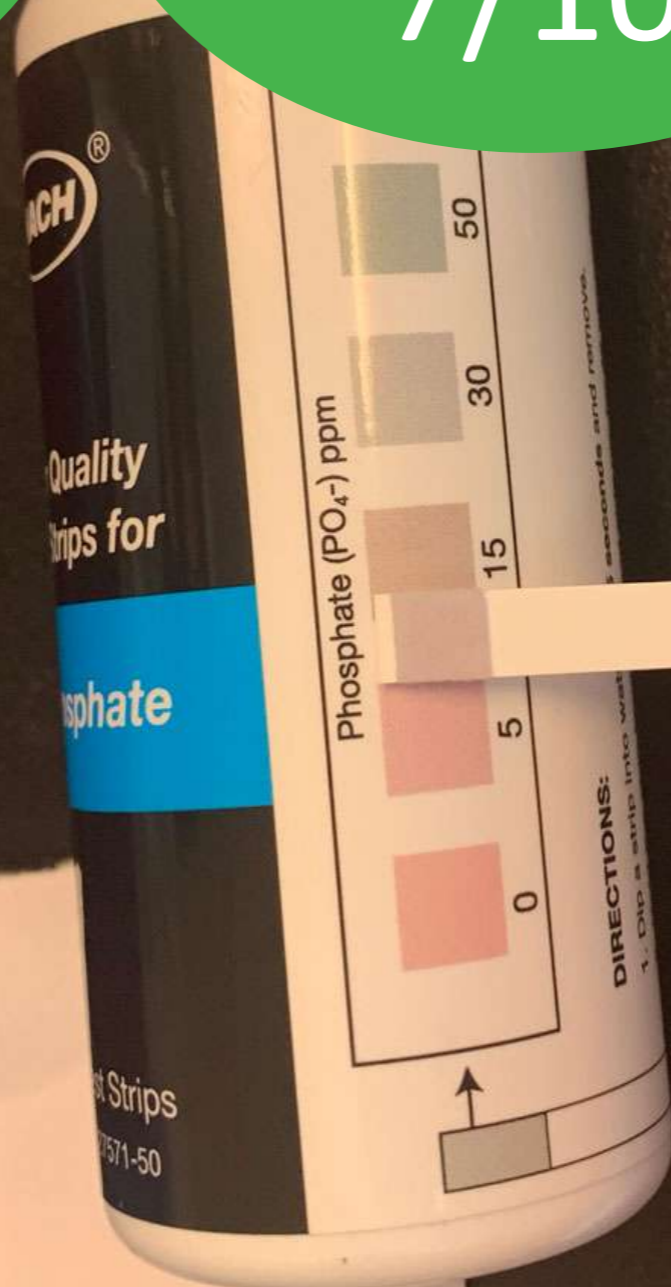
What exists NOW and how good are they?

Affordable?  
8/10

Easy-to-use?  
7/10

Accurate?\*

6/10

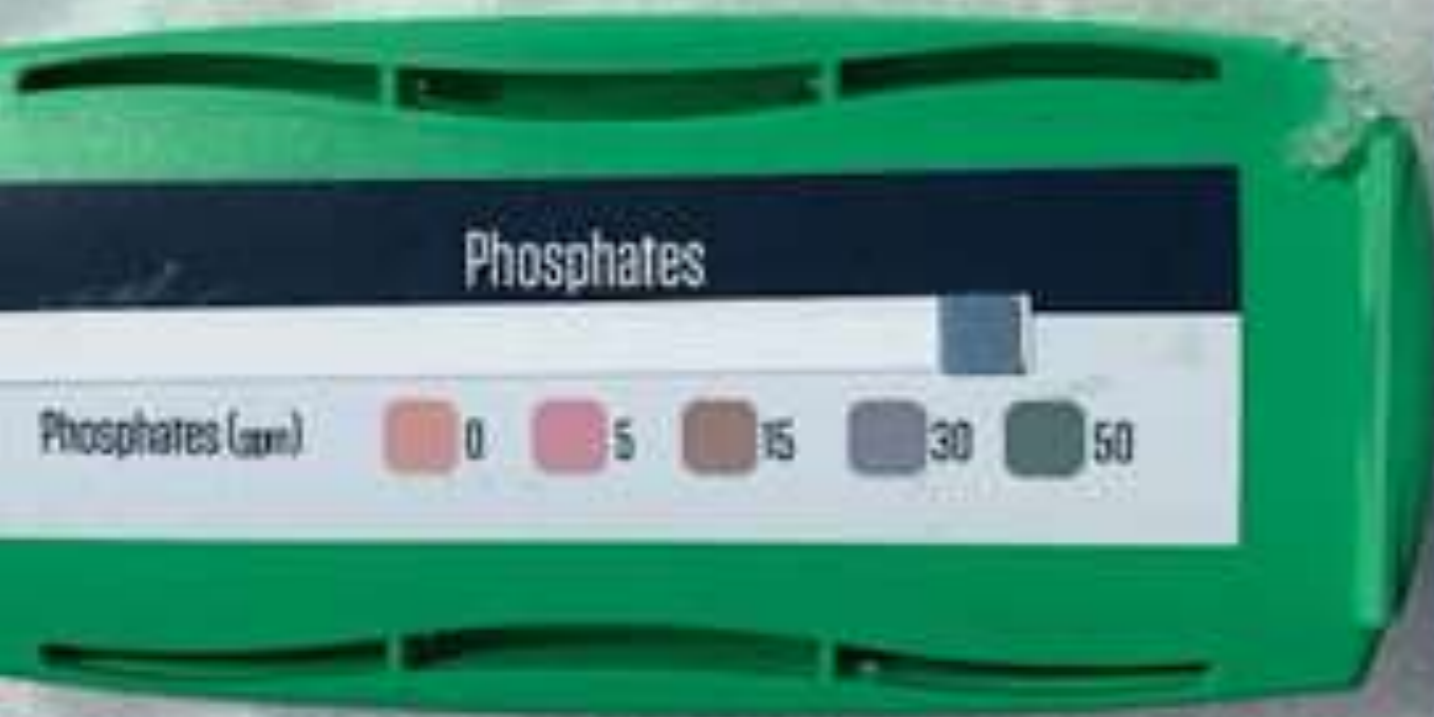


\*At very high levels (pollution)



# High-level phosphate study





**Outside**



**Inside**

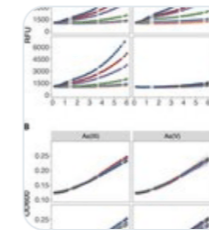
**Megan-Rae (Muskrat Lake)**



Martin Pothier  
@NanoMPP

Following

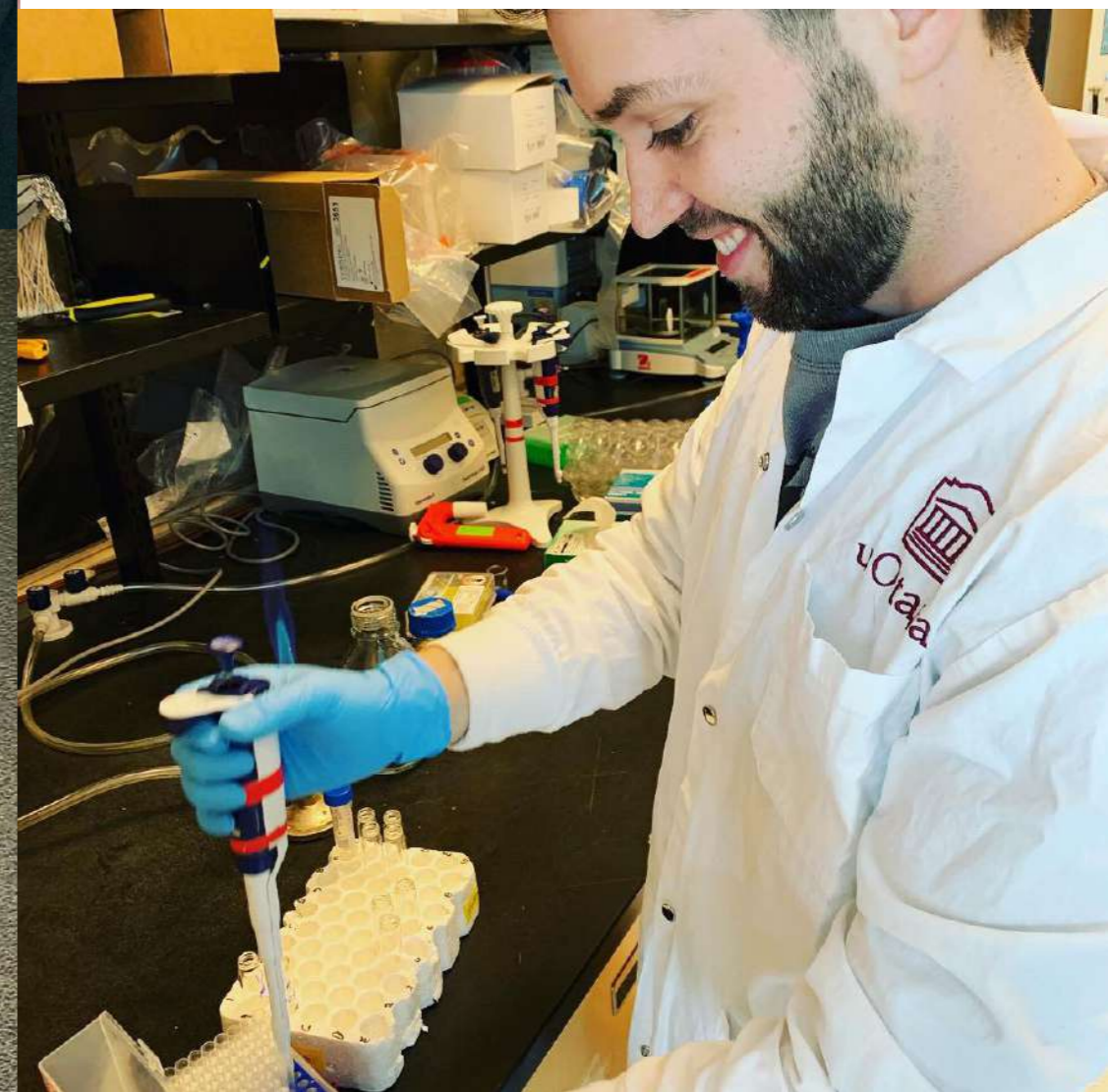
Our **#biosensor** assay can determine the speciation of arsenic in **#water**. My talk tomorrow includes this work along with our latest findings on how DOM & UV controls the **#bioavailability** arsenic in the **#environment**. Have a read, it's **#OpenAccess!** **#ICOBTE** 🟢



**Insights Into Arsenite and Arsenate Uptake Pathways Using...**

Despite its high toxicity and widespread occurrence in many parts of the world, arsenic (As) concentrations in decentralized water supplies such as domestic wells remain often unquantified...

[frontiersin.org](https://www.frontiersin.org)







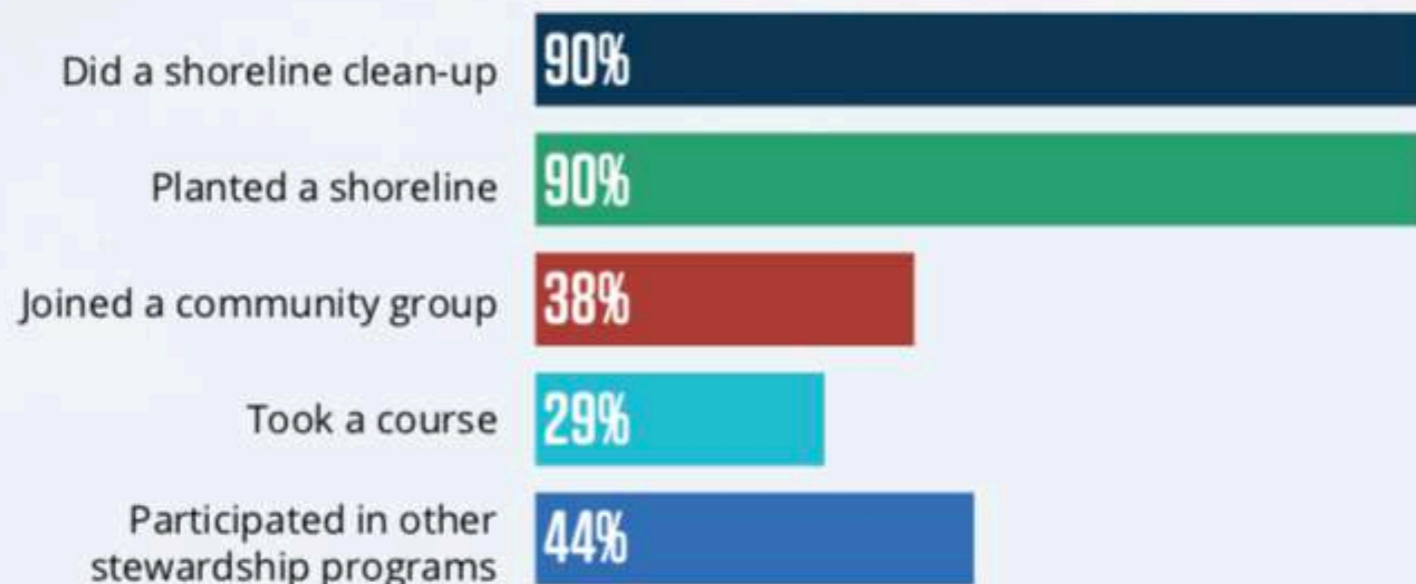
This is about people.  
(and better tools for them)

# Doing more!

We wanted to know: does participating in programs like this lead to ACTION? Participants almost all said, "YES!" This research informs our desire to create this app to help motivate and reward users.



## What they did



Based on 56 participant responses after Water Rangers testkit programs in 2017 & 2018.  
More information: [waterrangers.ca/transformation](http://waterrangers.ca/transformation)

2017-2018 testkit survey results

# WATER TESTING MAKES A DIFFERENCE!

We wanted to know... "how does testing affect the perceptions and behaviour of those testing?" This research is now being studied officially at the Carleton University Happiness Lab.

**93%**

Shared their knowledge with curious bystanders and 89% taught others about water chemistry and stewardship.

**77%**

Learned something new about their local waterbodies.

**78%**

Visited the water more often because of water testing.

“

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

- Conrad Gregoire, White lake





# What we're working on: understanding Machine Learning's role in water testing

Water tests come in a huge variety of forms, such as test strips and coloured liquids. This process, once validated, would be able to read many different types of tests.



Citizen conducts a water test & takes a photo on a reference card.



Machine learning compares the photo to thousands of reference photos



An algorithm applies the machine learning model to analyse colour and hue, adjusting lighting and tone



Machine learning overlays other datasets to help the user interpret results. User understands what results mean.



# Role in behaviour research



**Carleton**  
UNIVERSITY



**McGill**  
UNIVERSITY

**Water testing's effects on nature connectedness,  
values and stewardship behaviour.**

Results will be shared with partners, including  
NatureForAll.





HUB Ottawa  
Hari Advari  
My community is Blue Sky School

Charlotte  
Blue Sky School

I DON'T CHASE

CHEMets  
A kit of 100 test tubes for environmental monitoring







EDM

TO RIVERKAYAKING

EDM  
6 AUG 1 07

EDM

EDM





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With help from / Avec l'aide de



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