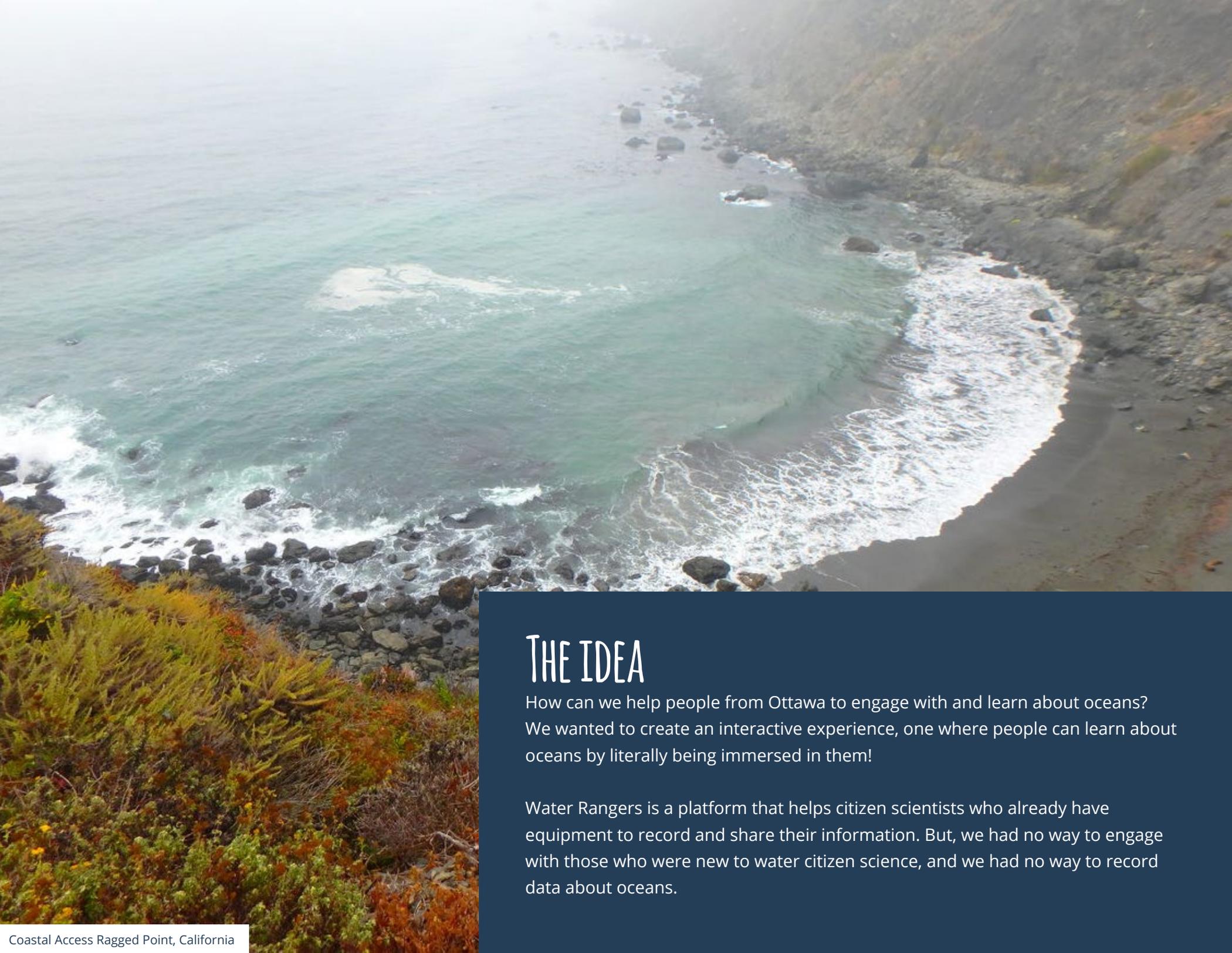




# OCEAN EXPLORERS TESTKITS





## THE IDEA

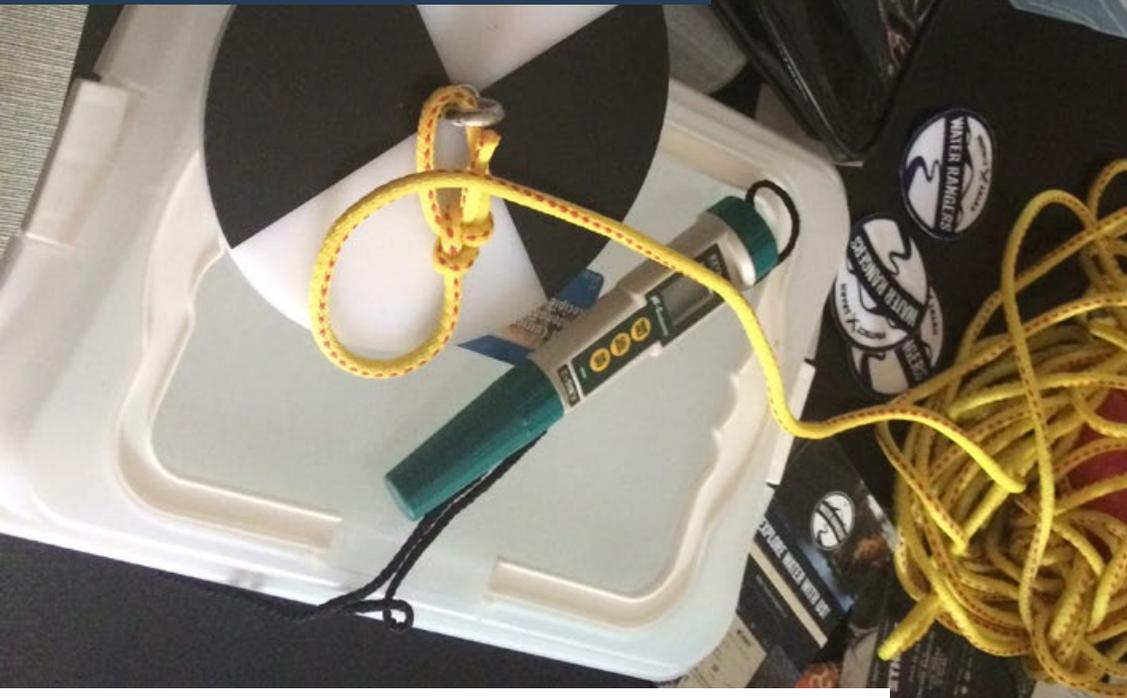
How can we help people from Ottawa to engage with and learn about oceans? We wanted to create an interactive experience, one where people can learn about oceans by literally being immersed in them!

Water Rangers is a platform that helps citizen scientists who already have equipment to record and share their information. But, we had no way to engage with those who were new to water citizen science, and we had no way to record data about oceans.



# WE LEARNED A LOT ABOUT MAKING TESTKITS

Through prototyping, we tried out different test types and equipment, learning what does and doesn't work. We had to find out by testing the experience itself: was the test easy to do? We then adjusted the video and the training book to match. We still haven't found the ultimate bag, but by using 2nd hand ones, we're able to reuse old lunch bags and cosmetic bags and they have been a big hit!



Chaos of supplies: finding the right match between test equipment and citizen science



Calibrating equipment

# CREATING THE PROGRAM WAS A HUGE EXPERIMENT.

Part of the challenge for this project was organizing those who were borrowing the kits. So, we created an online checkout system, and used Google Calendars to keep track of where our testkits were and when they'd be back.

We also made a training video and a field guide that explained how to conduct tests. Our volunteers told us that in-person training was the best though! Kat ended up spending a lot of time driving around the city, picking up and dropping off testkits. It's a good way to hear about, in person, the challenges and the excitement from our volunteers.



Our checkout system!

## HELP US BETA TEST OUR KITS!

We're looking for people from Ottawa to help us test out our kits this summer when they go to the ocean. Each test should take approximately 5 minutes. Get your training [here](#). You can take out the kits for a week or two. We'll reserve it for you and make sure you get it before you leave on your holiday to the ocean!

## EACH OCEAN EXPLORER TEST KIT CONTAINS

- Thermometer
- Conductivity meter (for freshwater) with water temperature gauge
- Refractometer (for salinity in ocean water)
- pH strips
- Sample container
- Secchi disc (for water clarity)
- 5 Whirl-pak specimen bags
- Notepaper to fill out when offline
- Field guide (explains how to conduct tests)
- Pen
- A waterproof bag to put your phone in

Status	Name	Images	Description
Out in the field	Ocean Explorer: 1		See calendar below for availability.
Out in the field	Ocean Explorer: 2		See calendar below for availability.
Out in the field	Ocean Explorer: 3		See calendar below for availability.
Out in the field	Ocean Explorer: 4		See calendar below for availability.
Out in the field	Ocean Explorer: 5		See calendar below for availability.
Out in the field	Ocean Explorer: 6		See calendar



**Kat Kavanagh**  
 July 23 · Ottawa · 🌐 ▼

We're looking for people from Ottawa who are visiting our oceans this summer to bring a test kit with them!

Learn more and checkout a test kit here: <http://waterrangers.ca/training>

You'll be able to test things like pH, salinity, temperature and water clarity (using a secchi disk!). We give you a waterproof phone case, note pages for when your phone has no reception, a field guide plus some sample containers. We also have a training video and I'm always around to provide supp... See More



👍 Like    💬 Comment    ➦ Share

👍 Water Rangers, Kelly Ann Swallow, Lisa Burbidge and 13 others

16 shares

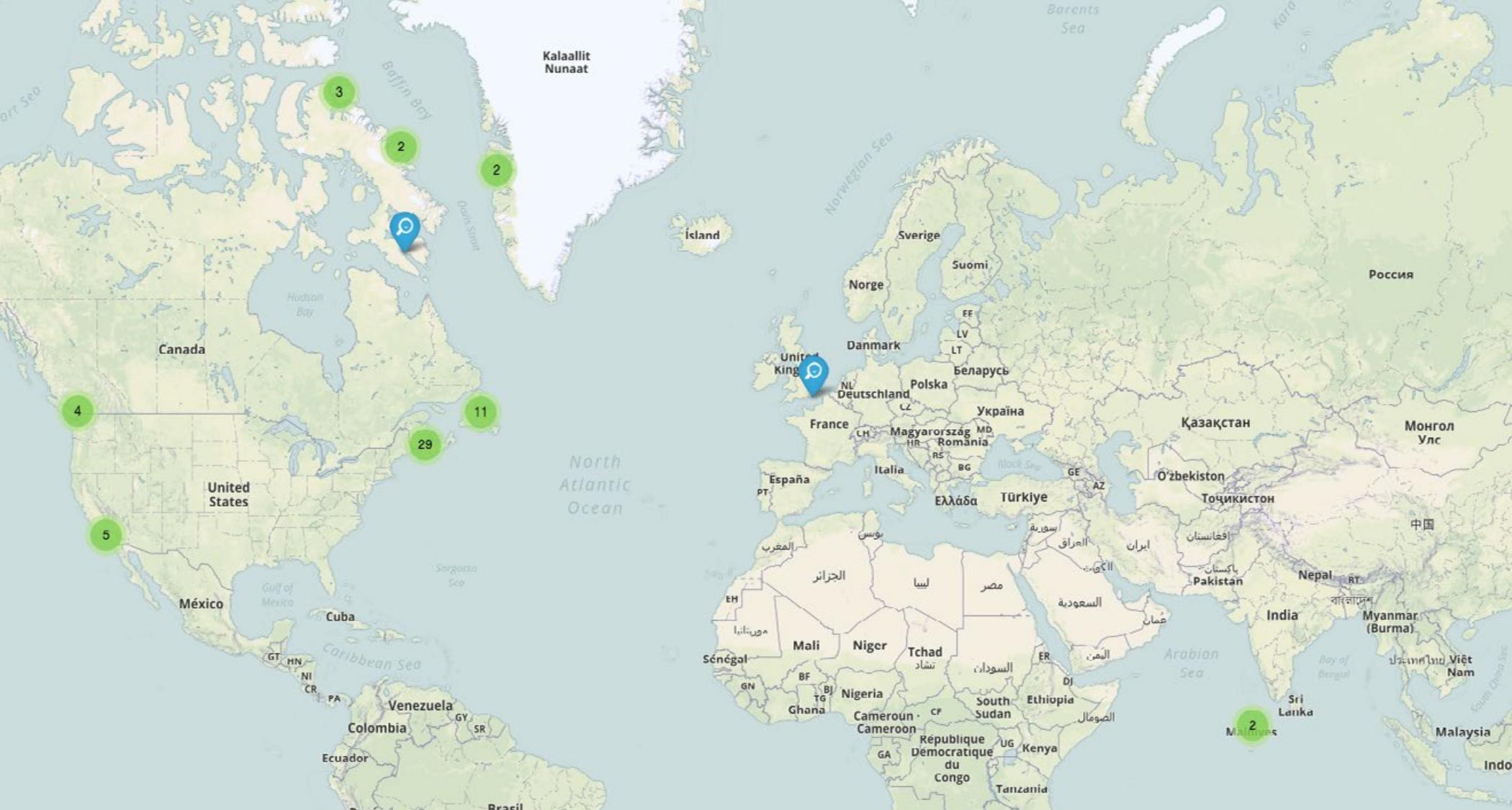
# WE CREATED 10 TESTKITS & ADVERTISED ON FACEBOOK, TWITTER & WITHIN HUB OTTAWA.

Facebook was best at recruitment, with 16 shares; we got lots of interest from friends of friends. Hub was also a great place to present the kit to members.



**Water Rangers** @water\_rangers  
 From Ottawa visiting an ocean soon? Take a testkit! <http://WaterRangers.ca/training>  
**#ottwavemakers** now on display  
 @HUBOttawa [pic.twitter.com/bGozZOvOaf](http://pic.twitter.com/bGozZOvOaf)

Impressions	2,454
Total engagements	77
Detail expands	24
Media engagements	16
Retweets	11



# 4

### Oceans visited

Atlantic, Pacific, Arctic & Indian.  
They created 70 observations  
in 59 locations.

# 26

### Testkit Check-outs, 22 by women

22 completed at least one observation.  
Due to circumstances, some were unable  
to conduct their field test.

# 60

### Approximate direct participants

Based on feedback, most conducted  
tests with family or friends, balancing  
out the gender gap.

# 93% INVITED OTHERS TO LEARN WITH THEM.

Most of the participants reported that they had help when they conducted tests, mostly from family members.

While it was mostly women aged 30-40 checking out the kit, overall, both sexes and ages 3 to 75+ participated in testing.

## ANYONE HELP YOU WITH THE TESTS?

"My husband. I think he was more excited than me to do some testing."

-Veronique, visiting New Brunswick

"yes, lots of people - mostly kids. Adults and kids LOVED it."

-Brigitte, visiting Vancouver

"Parents helped, but our son used the equipment and read off data."

-Stefanie Lomaski, visiting PEI





“THAT WAS FUN!!!  
MUM, KIDS AND I WERE  
TOTALLY INTO IT.”

“Phoebe was on pH duty. We went to three different sites. And I discovered a new invasive species - green crab. I even got a picture of it. I'll get Kirsten to go to the same sites next week. Mum was really into it. She may take it out to the middle of the harbour when she is out boating next week.”

- Eden, visiting Nova Scotia



Davis Strait, Karrat Fjord, Greenland



Pier in Frobisher Bay, Iqaluit



Eclipse Sound, Pond Inlet coast, Nunavut



# WE HAD 3 ARCTIC EXPLORERS!

One toured many places and two visited places in Iqaluit!  
"The other passengers were always keen to let me do tests and the zodiac drivers were a big help."  
- Pat Tait, Arctic Ocean Explorer!



**Water Rangers** @water\_rangers  
 AMAZING Ocean Explorer & @otrriverkeeper  
 @pattait tested Arctic waters!  
<https://app.waterrangers.ca/observations/20419> ... #ottwavemakers ❄️  
[pic.twitter.com/EpSa1G7zbV](https://pic.twitter.com/EpSa1G7zbV)

Impressions	836
Total engagements	21
Likes	8
Media engagements	5
Retweets	4

# MOST SAID IT OPENED UP CONVERSATIONS WITH BOTH FAMILY AND OTHER MEMBERS OF THE PUBLIC.

"I had a better awareness of water quality and chatted with the lifeguards at the beach about their own measurements, which was really interesting. It inspired me to engage and not take the ocean quality for granted. I appreciated the ocean and the Maritimes even more!"

-Heather, visiting Nova Scotia & New Brunswick





87% SAID THAT THEY WOULD DEFINITELY LIKE TO PARTICIPATE AGAIN, WITH MANY ASKING IF THEY COULD HAVE A KIT TO USE ALL THE TIME!

“can you please include a SUP in your kit? thanks.”

-Brigitte, East & West Coasts

“I loved geeking out and helping with citizen science. I actually wish there had have been more tests I could have taken!”

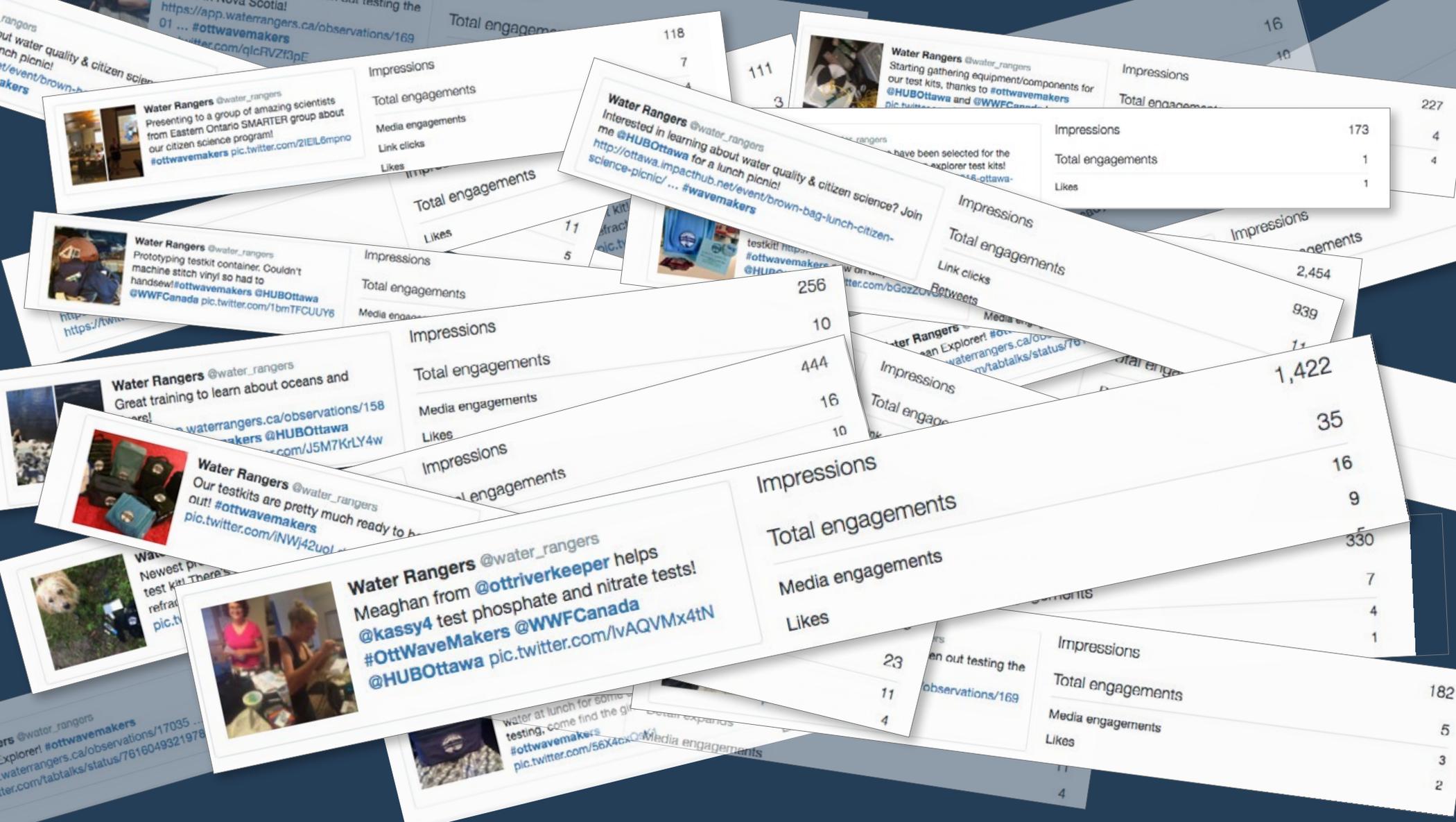
- Tabatha, visiting the East Coast



## 95% OF PARTICIPANTS REPORTED THEY LEARNED SOMETHING NEW.

"I learned that the pH and salinity vary greatly between even small distances. I also learned about an invasive species that I was not previously aware of. It was so fun to be able to visit the ocean AND contribute to science. I have a great love of water, especially the ocean, and am so thrilled to be able to contribute to data collection that may be able to direct research. I'm really looking forward to doing it again when I go back to NS!"

- Eden, visiting Nova Scotia



# 835

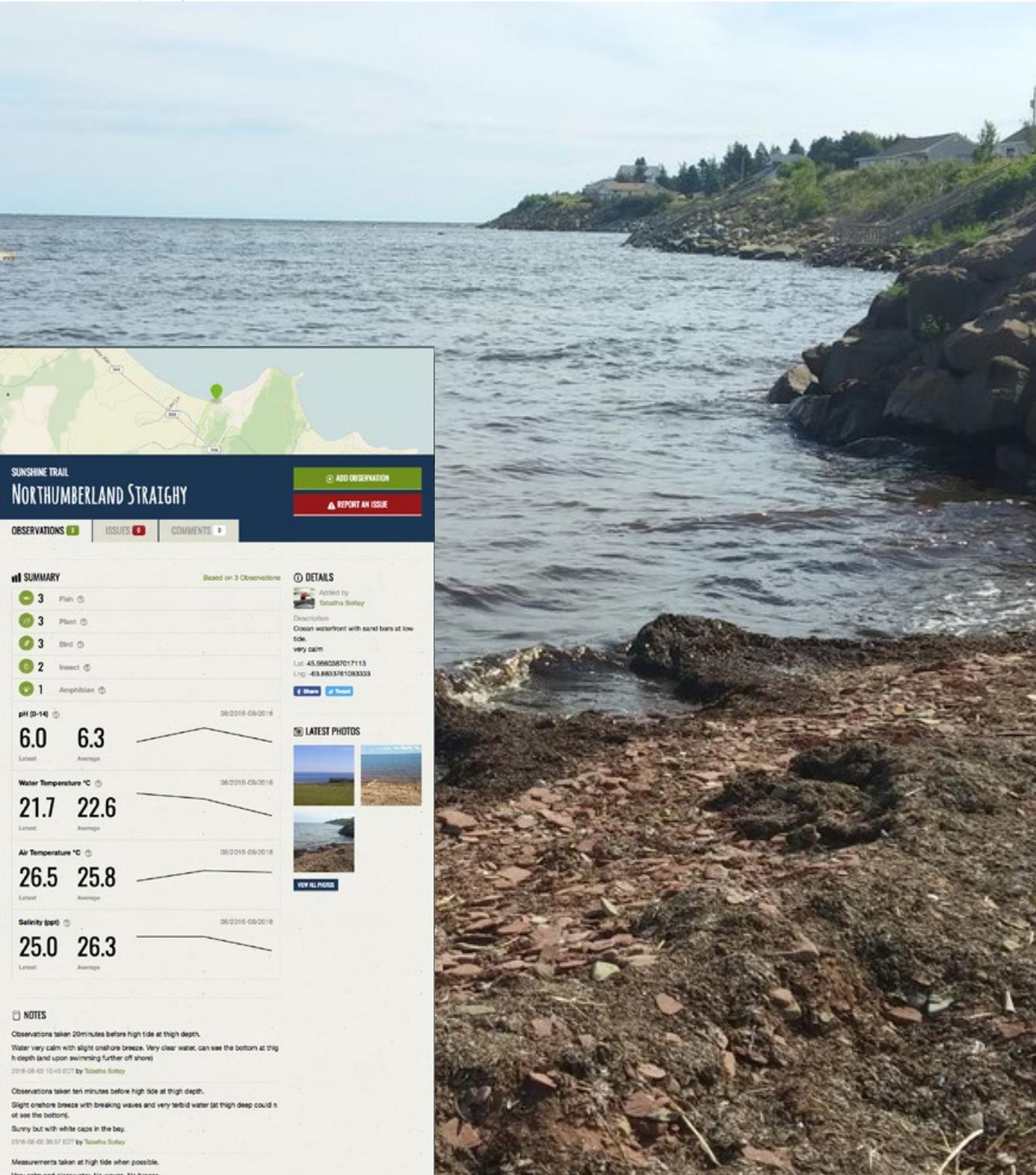
# 8,820

# 246

**Direct Pageviews on our site**  
For our training, checkout and group page.

**Twitter Impressions**  
(based on our tweets)

**Total engagements**  
such as likes, media, and retweets



# PARTICIPANTS WERE ENCOURAGED TO VISIT THE SAME PLACE MORE THAN ONCE.

While not necessary, it gave them a chance to see small changes during their trip. A few participants did this. Others reported once per location. Those that reported more than once on their trip seemed to have a higher appreciation for the program, the ocean and the process. The more they reported, the more they enjoyed it!

“The first water test was like slowly wading into cold and unfamiliar waters, but as I grew familiar with the equipment and processes, it was easy to dive right in every day before I went out for a swim. Super easy, fast and fun! Now I just have to figure out how to get my hands on a test kit permanently.”

- Tabatha, Visiting the East Coast

**SUNSHINE TRAIL**  
**NORTHUMBERLAND STRAIT**

ADD OBSERVATION  
REPORT AN ISSUE

OBSERVATIONS 1 | ISSUES 0 | COMMENTS 0

**SUMMARY** Based on 3 Observations

- 3 Fish
- 3 Plant
- 3 Bird
- 2 Insect
- 1 Amphibian

**DETAILS**

Added by: Tabatha Solley  
Description: Ocean waterfront with sand bars at low tide, very calm  
Lat: 45.966287017113  
Lng: -63.8833761083333

**LATEST PHOTOS**

**PH (pH)** 6.0 (Latest) / 6.3 (Average)

**Water Temperature °C** 21.7 (Latest) / 22.6 (Average)

**Air Temperature °C** 26.5 (Latest) / 25.8 (Average)

**Salinity (ppt)** 25.0 (Latest) / 26.3 (Average)

**NOTES**

Observations taken 20 minutes before high tide at high depth.  
Water very calm with slight onshore breeze. Very clear water, can see the bottom at this depth (and upon swimming further off shore)

2016-06-02 10:43 EDT by Tabatha Solley

Observations taken ten minutes before high tide at high depth.  
Slight onshore breeze with breaking waves and very turbid water (at high depth could not see the bottom).  
Sunny but with white caps in the bay.

2016-06-02 09:57 EDT by Tabatha Solley

Measurements taken at high tide when possible.  
Very calm and clear water. No waves. No breeze.

2016-06-01 07:57 EDT by Tabatha Solley

Northumberland Strait, Sunshine Trail, Nova Scotia

- 70 OBSERVATIONS
- 59 LOCATIONS
- 1 ISSUES



## Water Rangers OCEAN EXPLORERS TEAM

EDIT GROUP

<http://waterrangers.ca/training>

### LEADERBOARD

- Kat Kavanagh**  
3145 Points
- Pat Tait**  
1760 Points
- Gail and Lorne Clark**  
870 Points
- Jordan Ross**  
220 Points
- Ollie Kavanagh**  
115 Points
- Mark Dabrowski**  
105 Points
- Tabatha Soltay**  
100 Points
- Eden D'Entremont-MacVicar**  
90 Points
- Meaghan Murphy**  
90 Points
- Veronique Albert**  
40 Points

### ABOUT

This group are exploring both fresh and salt water. We hail from Ottawa, and as we travel to our oceans, we take samples. Our goal is to educate Ottawa people about our ocean's health! This program is made possible by Ottawa Wavemakers.

### TESTING PROTOCOL

We test using our own testkits. If you'd like to join this group, you'll have to borrow a kit. We're testing for air temperature, water temperature, secchi depth, pH, and salinity. We are also encouraging visual observations for wildlife and issues. See <http://waterrangers.ca/training> for video and guide

Do you want to borrow a testkit to go to the ocean? Request one here:  
[Read More](#)

### MEMBERS (24)

 <b>Ollie Kavanagh</b> Last Observation Sat, 24 Sep 2016 18:51 EDT 6 1	 <b>Kat Kavanagh</b> Last Observation Wed, 12 Oct 2016 08:28 EDT 101 2
 <b>Mark Dabrowski</b> Last Observation Sat, 27 Aug 2016 12:07 EDT 4 2	 <b>Meaghan Murphy</b> Last Observation Sat, 30 Jul 2016 15:10 EDT 8 0
 <b>Tabatha Soltay</b> Last Observation Wed, 17 Aug 2016 16:00 EDT 8 0	 <b>Gail and Lorne Clark</b> Last Observation Sun, 28 Aug 2016 10:30 EDT 38 0

1 2 3 4 Next Last

### AREAS MONITORED

Worldwide

### Locations & Observations



# AT LEAST 4 PEOPLE SAID IT LED THEM TO VISIT MORE BEACHES.

Our highest observation count came from Gail & Lorne, who visited 10 separate locations on their trip! Two others visited 8 locations, while many only visited one.

Each observation report gets linked to the Ocean Explorers group on the Water Rangers website.

<https://app.waterrangers.ca/groups/water-rangers-ocean-explorers-team>

WITLESS BAY NEWFOUNDLAND : WITLESS BAY, ATLANTIC OCEAN

## OBSERVATION REPORT

<b>8.0</b> pH (0-14)	<b>18.0</b> Water Temperature °C	<b>22.0</b> Air Temperature °C
<b>BOTTOM VISIBLE</b> Secchi Depth (m)	<b>33.0</b> Salinity (ppt)	

**OBSERVATIONS**  
Bird

**DETAILS**  
View Location summary  
Observed on Sun, 21 Aug 2016 10:30 EDT  
Observed by Gail and Lorne Clark  
Associated with Water Rangers : Ocean Explorers Team  
Lat: 47.2767373572335  
Lng: -52.83134630721654

**LATEST PHOTOS**

**ICE OFF** Since 2010-08-21



Saco Bay, Scarborough, Maine

# "I LOVED THIS PROGRAM."

"It was an easy way to be introduced to citizen science and anyone could do it. The kit and guide explained everything really well. My four-year-old loved it as did my 60 year old mother. Well thought out and delivered! A fantastic way for people to connect with oceans."

-Meaghan, visiting Maine



Goose Bay, Bloomfield Newfoundland



## 50% LOVED USING THE REFRACTOMETER THE MOST:

"I loved the salinity test ... so cool to see the line appear out of nowhere. Also, it was the coolest looking device I had - hard core!"

Another favourite was temperature:

"The air and water temp were particularly interesting - we were in a spot that touts itself as the 'warmest salt beaches in Canada' and north of Florida. The water was warmer than the air the day we tested! :)"

# 70%

**Used field sheets & reported online later**

Many noted that our platform didn't work in remote places that didn't have internet. Something we will work on!

# 50%

**Found our platform intuitive**

So much more work on making sure that the platform works for first-time users

# 80%

**Were glad they had a field guide** and some noted that they referred to it often



“WE BECAME SO MUCH  
MORE AWARE OF  
WILDLIFE NEAR THE  
BEACH AND ON PEI.”

“We now find ourselves pointing out wildlife/insects back in Ottawa. We had an excellent experience, and it was a way to bring our family together. We had great talks about why we would want to test the sea temperature and how we can take care of our earth/water.”

- Steve & Stefanie Lomaski, visiting PEI

“I noticed more little things like critters, vegetation etc through observing and it was surprising to find out the saline level, that the ocean where we were wasn't very salty!”

-Heather, visiting the East Coast



# MALDIVES

Our furthest sample point

# NOVA SCOTIA

Our most visited location

# IQALUIT

Our most surprising double visit

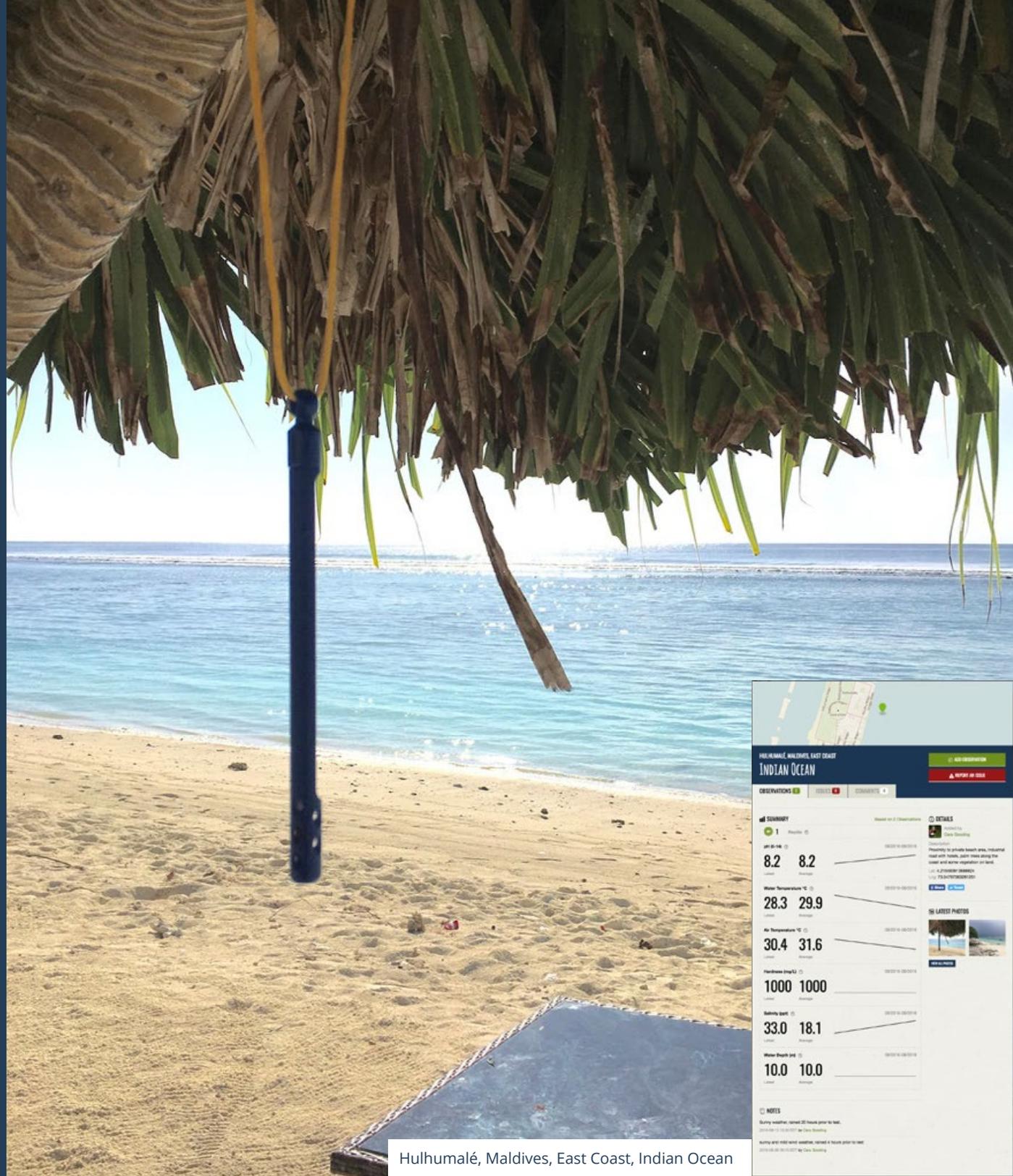
# LANCASTER SOUND

Our most Northern point

## + A BIT OF FRESHWATER!

"I'm always interested in the waterways in my community and our impacts to them. This program is great for community engagement and education!"

- Melissa, visiting Montreal



**HULHUMALÉ, MALDIVES, EAST COAST**  
**INDIAN OCEAN**

Observations: 1, Details: 0

Parameter	Value	Unit
Salinity	8.2	PSU
Water Temperature	28.3	°C
Air Temperature	30.4	°C
Humidity	1000	mmHg
Salinity	33.0	PSU
Water Depth	10.0	m

NOES: Sunny weather, normal 20 hours prior to last...

Hulhumalé, Maldives, East Coast, Indian Ocean



## IN-PERSON WAS THE BEST WAY TO ENGAGE PEOPLE.

A lot of our enthusiasm came from speaking with volunteers face-to-face. We also presented this project as part of introductory talks to Water Rangers, and it was by far the engagement they were most excited by. Feedback after speaking engagements was often, "Can I borrow/buy a testkit right now? How do I start testing the waters right away?"

# ~80

**People were taught how to use kits directly** and why monitoring is important for Ocean health

# ~700

**People introduced to the kits through speaking engagements** from Aquahacking, GLOS, SMARTER and Sustainability Eastern Ontario

# DID YOU LEARN ANYTHING NEW?

“ Harbours are apparently the worst water quality areas -- boats tend to open their septic systems -- it is legal to open septic systems in open ocean and throw away any kind of trash (over board).”

- Jordan, visiting San Diego

“We learned a lot about Puffins, Common Murre, Cod Fish, Rock Weed and we learned the average PH, water temperatures and salinity of the ocean. Doing the testing generated several interesting conversations with locals, we learned a lot about the ocean with them. The cod fish have recovered, many people commented that the commercial cod fishery should be reopened. Puffins and Common Murre are amazing birds. Puffins live out on the North Atlantic all winter and don't touch land till spring, and the young go out to the ocean and don't see land for 3 years. Murre can dive 600 feet for food. Wow! ”

- Gail & Lorne, on tour around Newfoundland



Burns Cove, Lundenburg, Nova Scotia

# WHAT WE LEARNED

This program was overwhelmingly a huge success. Of course, if we did it all again, we'd do it bigger and better!

Our two biggest challenges were that it took time to figure out where to get supplies from and then shipping took longer than expected, so we were unable to start the program as people were leaving on trips around July 1.

We also didn't realize how much time we'd need to drop off/pick up kits and provide in-person training.

Some of the equipment (pH, conductivity meters) also got destroyed because of the salt-water, and we may have to reconsider some of our equipment choices.

We would love to continue this program in coming years and we hope, with additional funding can expand it to reach more people.



Torrey Pines State Park, San Diego



English Beach, Vancouver



Gibbs Fjord, Baffin Island



Brighton Beach, UK

**wm**  
OTTAWA  
WAVE MAKERS



THANK YOU,  
FOR MAKING OCEAN EXPLORERS POSSIBLE!

