



# Citizen Science in Severn Sound – Assessing Program Success

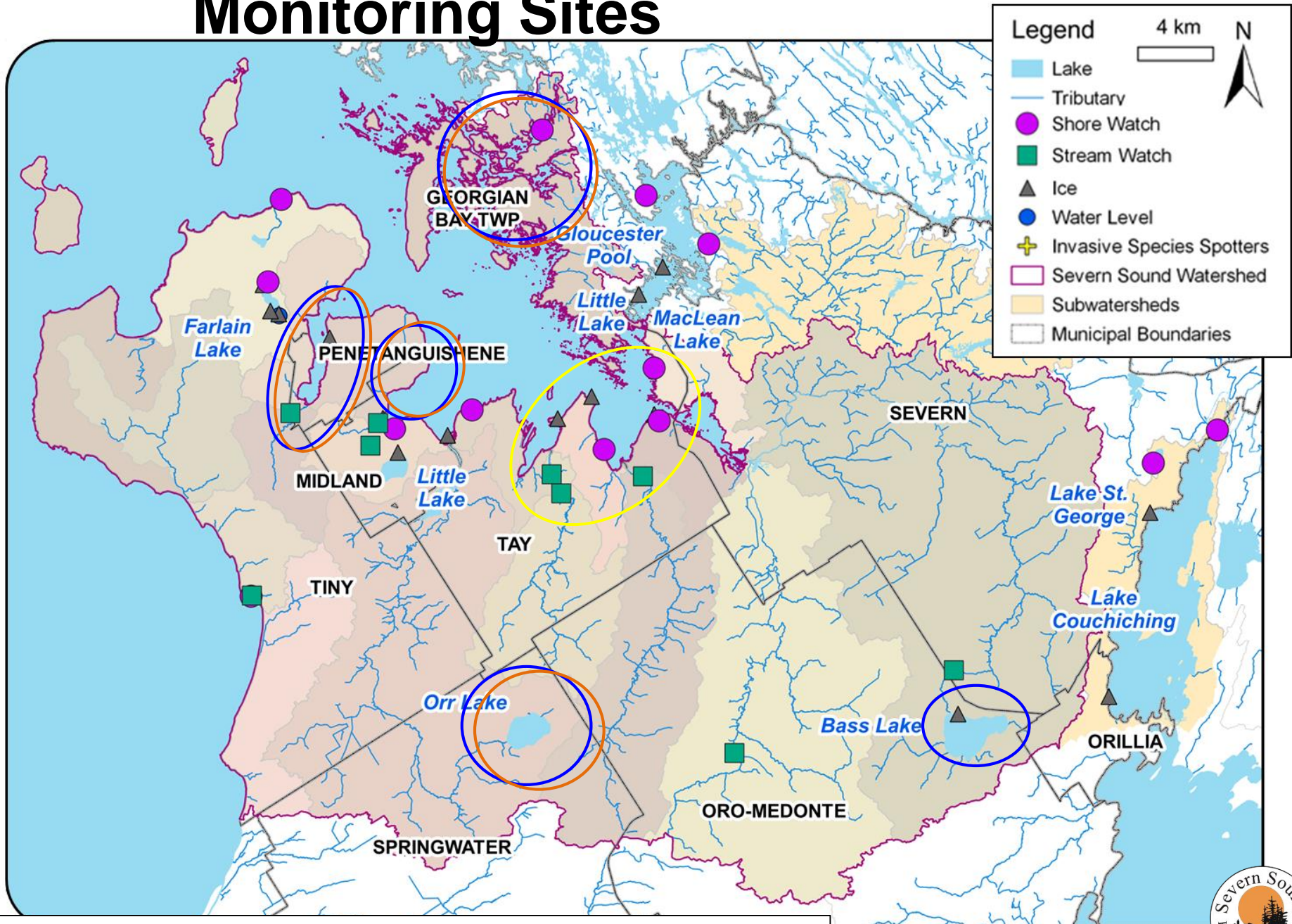
Emily Edgley, Citizen Science & Water Quality Coordinator  
SSEA Board Meeting  
April 28, 2022



TOWNSHIP OF/CANTON DE  
**Tiny**







# Monitoring Sites



Produced by the Severn Sound Environmental Association with Data supplied in part from the County of Simcoe, the Ontario Ministry of Natural Resources and Forestry (© Queen's Printer 2021) and under License with Members of the Ontario Geospatial Data Exchange, 2021. While every effort has been made to accurately depict the data, errors may exist. Any party relying on this information does so at their own risk. Not for navigational purposes.



# Citizen Science Sites by Municipality

	<b>Shore Watch</b>  Shore Watch	<b>Stream Watch</b>  Stream Watch	<b>Invasive Species Spotters (SSW)</b>  Invasive Species Spotters	<b>Ice Spotters</b>  Ice Spotters	<b>Water Level Watchers</b>  Water Level Watch	<b>Total</b>
Tiny	3	2	1	4	2	<b>12</b>
Penetanguishene				1		<b>1</b>
Midland	1	1	1	2		<b>5</b>
Springwater						<b>0</b>
Oro-Medonte		2				<b>2</b>
Tay	4	3	3	3		<b>13</b>
Severn	3*	1	1	1*		<b>6</b>
Georgian Bay	1 +2*		4	2		<b>9</b>
Other						
<b>Total</b>	<b>14</b>	<b>9</b>	<b>10</b>	<b>13</b>	<b>2</b>	<b>48</b>

\*Outside Watershed



# 2021 Participation Summary

Program	Initial # Volunteers	Actual # Volunteers	# Monitoring Sites	Total # Person-Days
Shore Watch	23	15	14	109
Stream Watch	16	10	9	203
Invasive Species Spotters (SSW)	16	16	10	66
Ice Spotters	13	13	13	40
Water Level Watchers	2	2	2	13
<b>TOTAL</b>	<b>70</b>	<b>56</b>	<b>48</b>	<b>431</b>

- Age range: under 10 to over 60
- Water bodies monitored: 15
- Photos submitted: 531
- Training/learning sessions held: 2 training webinars, 3 new task specific videos, 1 educational webinar with guest speaker
- Participants in training/learning sessions: 16 live participants, 63 views for training webinar; 114 total views for task specific videos, 5 live participants, and 40 views for educational webinar = 238



# Citizen Science in Severn Sound



## Shore Watch – 2020 (with some history)

- Done from shore, dock or boat
- Measurements: air & water temperature, weather & wave conditions, water clarity & conductivity, environmental observations



## Stream Watch – 2020

- Done from streambank or bridge
- Measurements: air & water temperature, weather & flow conditions, water clarity & conductivity, environmental observations



## Invasive Species Spotters – 2021

- Implemented to identify and monitor terrestrial and aquatic invasive species
- 2 focus species for 2021
  - Spongy (Gypsy) moth
  - Starry Stonewort



## Water Level Watchers – 2019

- Specific to one lake (Farlain)
- Measurements: weather & wave conditions, water levels read from installed gauge



## Ice Spotters – 2017

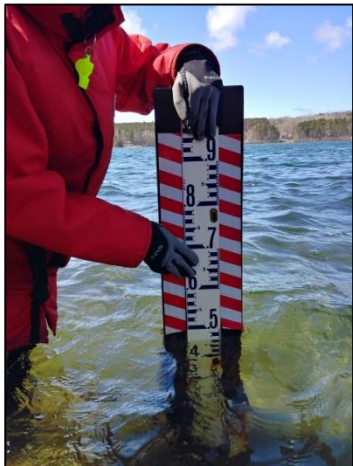
- Measurements: weather and ice conditions leading up to and including date of ice on/off





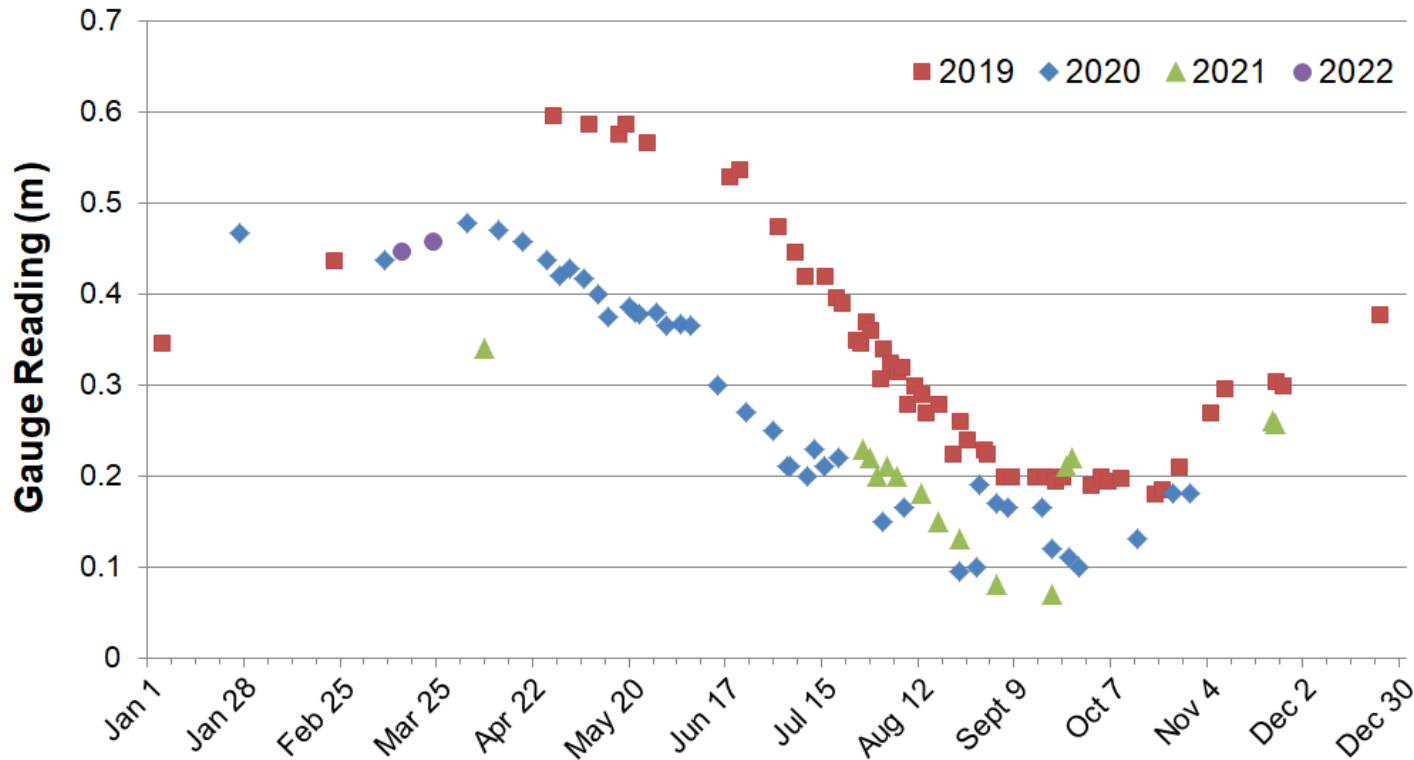
# Methods

- **Ice Spotters** – Begin when ice coverage is at ~50%; ice coverage & photos for verification
- **Water Level Watchers** – Several times per week; readings from gauge near public boat launch & photos for verification
- **Shore/Stream Watch** – Biweekly to multiple times/week, May-Oct; Secchi depth, weather vane/Beaufort Scale, rain gauge, Hanna meter/pool thermometer, temperature logger, habitat/impact observations, flora & fauna, invasive species (IS), nuisance algae
- **Invasive Species Spotters (SSW)** – Starry Stonewort (SSW) was monitored by Shore Watch Volunteers by completing aquatic rake tosses to determine absence or presence



# Farlain Lake Water Levels

Farlain Lake Water Levels, 2019-2022

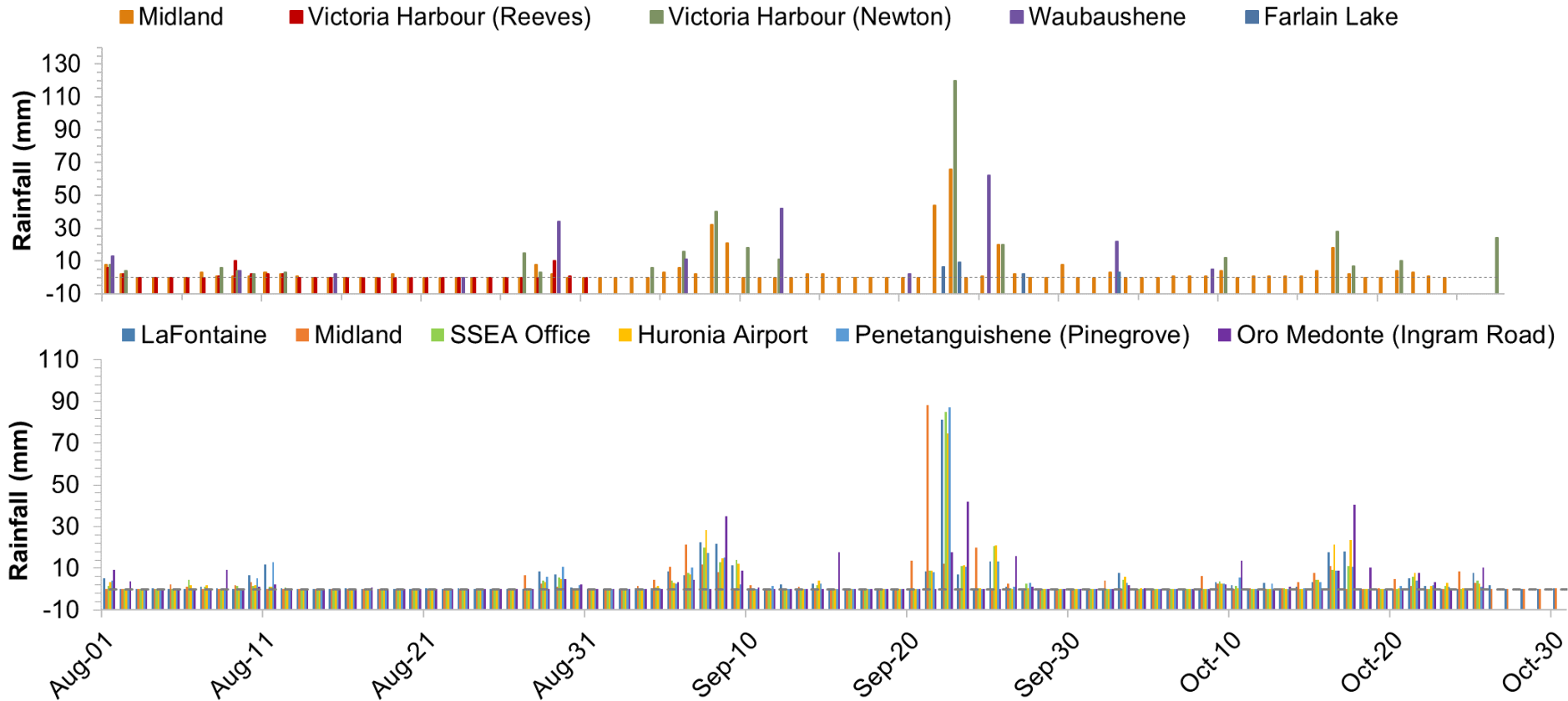


- Water level in 2020 lower than in 2019
- Water level in 2021 similar to 2020 but fewer observations were made
- Working on new signage & volunteer recruitment



# Weather - Rainfall

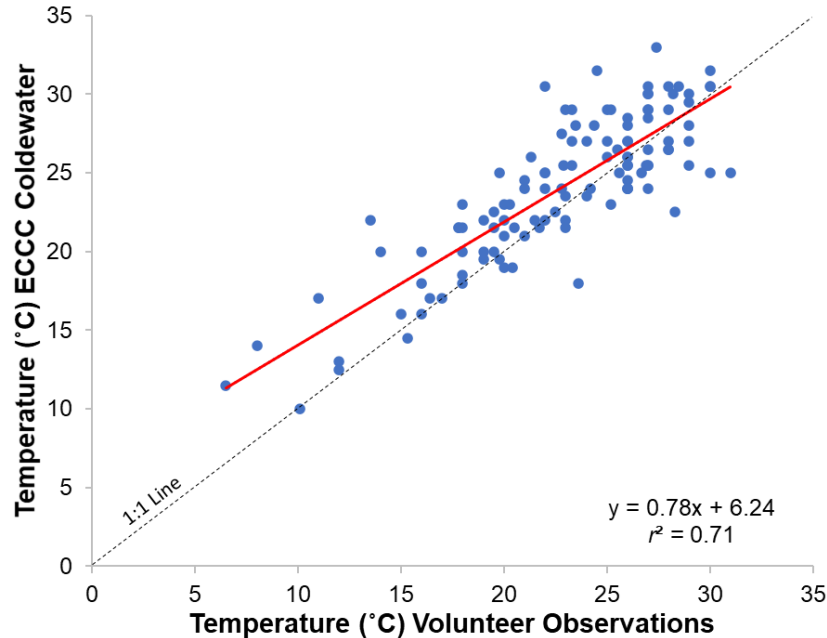
- Rainfall data collected at 5 volunteer sites



- Comparison to SSEA rain gauges shows major rain events captured by volunteers

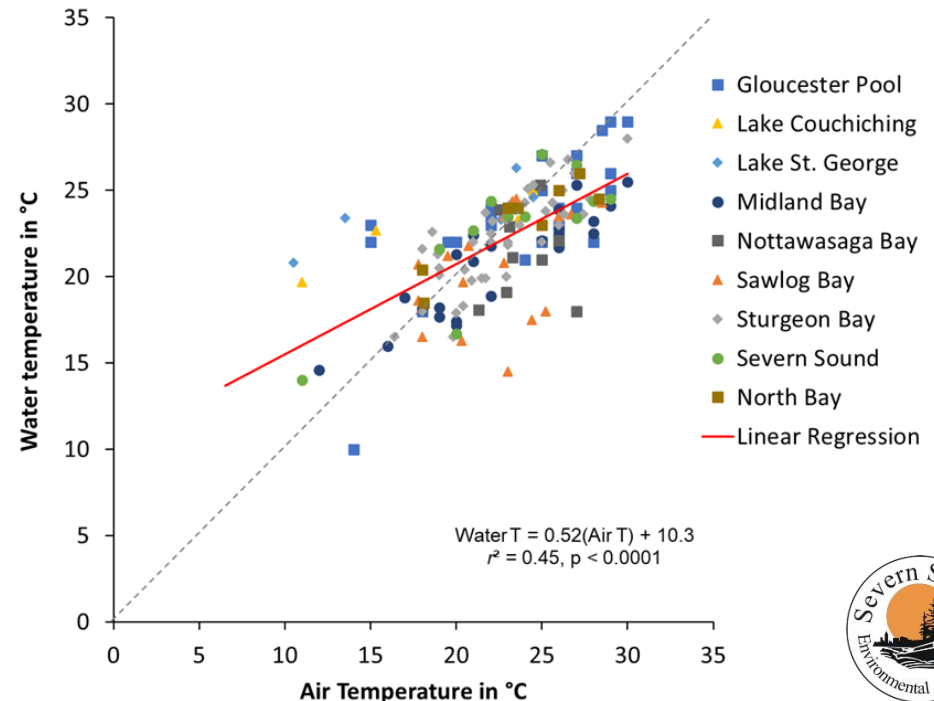


# Weather - Wind and Air Temperature

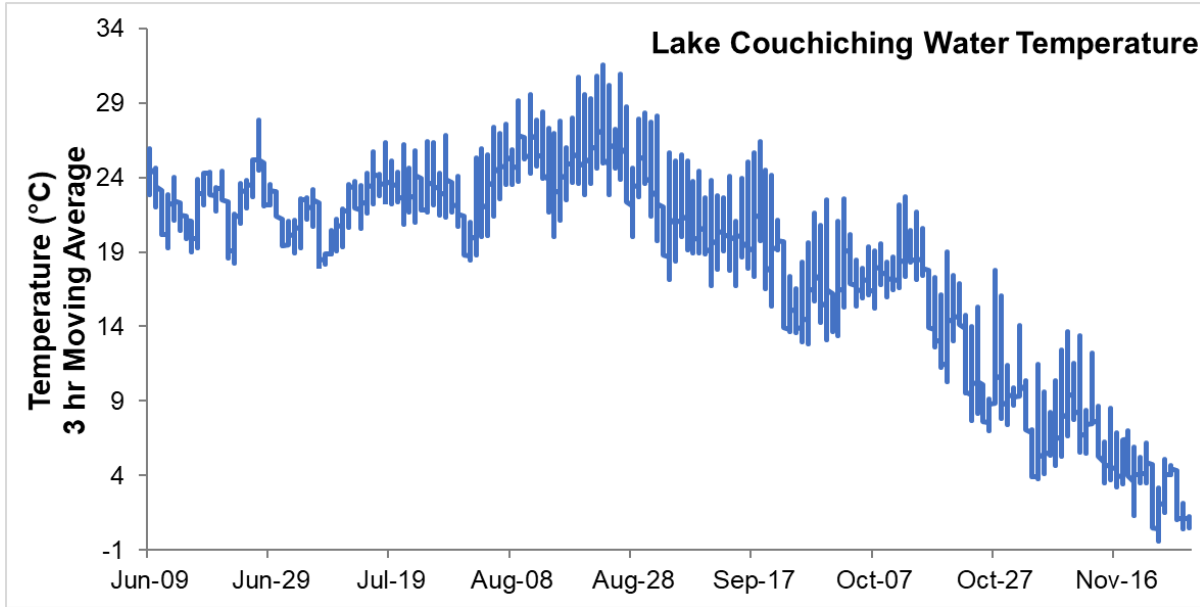


- Windy conditions corresponded to higher conductivity, observations of foam on the water
- Air temperature was not closely correlated to lake temperature

- Wind speed and direction measured at 14 lake sites
  - Didn't correlate well to other data sources, variability expected
- Air temperature measured at 22 lake and stream sites
  - Correlated well to other data sources

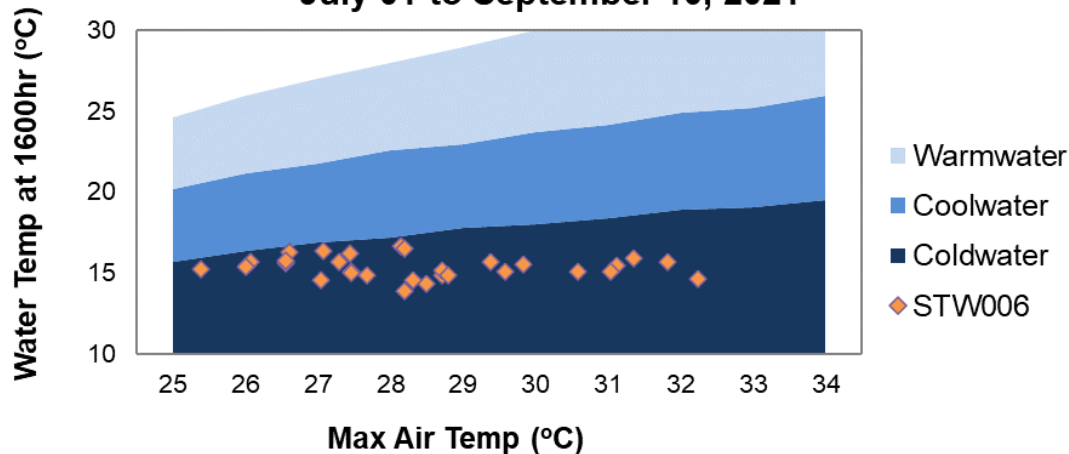


# Water Temperature



Temperature Logger Stats June 9th – November 28th, 2021	
Overall Minimum	-0.59
Overall Average	18.21
Overall Maximum	32.46
Minimum Daily Range	0.68
Average Daily Range	4.69
Maximum Daily Range	10.55
June 9th - June 30th Avg	22.24
July Avg	22.10
August Avg	24.96
Sept Avg	19.55
Oct Avg	14.92
Nov 1st - Nov 28th Avg	5.53

**Copeland Creek Thermal Stability  
July 01 to September 10, 2021**



Tributary	Thermal Classification
Coldwater River	Coldwater
North River	Warmwater
Copeland Creek	Coldwater
Vinden Creek	Coolwater
Hogg Creek Upstream	Coolwater
Hogg Creek Downstream	Coolwater

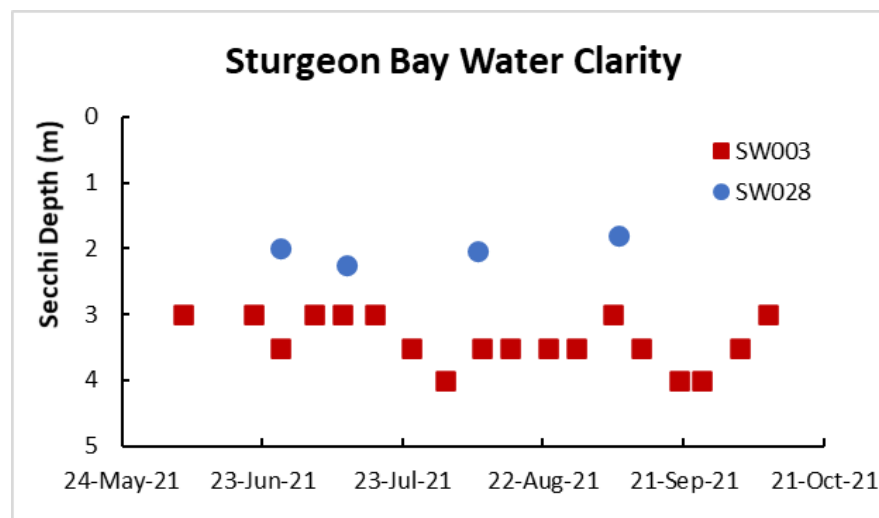
Thermal stability model: Stoneman & Jones, 1996. N Am J Fish Manage. 16:4, 728-737



# Water Quality

Waterbody	Latest SSEA Survey	Volunteer Conductivity (uS/cm)			Volunteer pH			SSEA Conductivity (uS/cm)			SSEA pH		
		Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
Lake Couchiching	2019	325	352	374	8.33	8.55	8.75	375	388	406	8.06	8.25	8.34
Midland Bay	2019	176	185	208	7.35	7.88	8.44	214	228	247	7.86	7.96	8.10
North Bay	2019	206	216	223	8.32	8.40	8.51	136	160	176	7.32	7.49	7.69
Sturgeon Bay	2019	53	247	333	7.41	8.29	9.18	197	284	329	7.78	8.12	8.48

- Water quality variables were generally within expected ranges based on existing SSEA data
- Many Shore Watch observers reported greenish hue to water
- Water clarity – wide range: low to high (Sturgeon Bay) low to moderate (Gloucester Pool), moderate (North Bay), and moderate to high (Midland Bay)



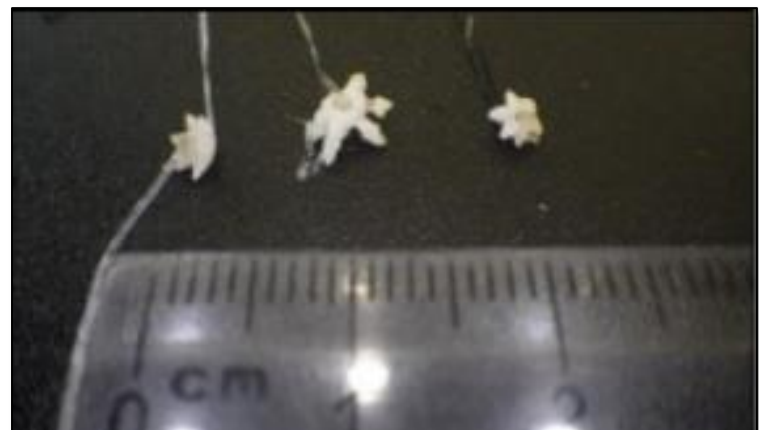
# Flora & Fauna

- **Algae Observations** – filamentous green algae in lakes and streams
- **Interesting Wildlife** - Osprey, Trumpeter Swans, Blue Heron, Great Egret, Frogs, Salamander, Mink, Muskrat, Otter
- **Species at Risk Observations** – Northern Map Turtle, Massasauga Rattle Snake, Eastern Fox Snake, Five-Lined Skink, Bald Eagle
- **Invasive Species Observations** – Eurasian Watermilfoil, Phragmites, Purple Loosestrife, Spongy Moth, Zebra/Quagga Mussels



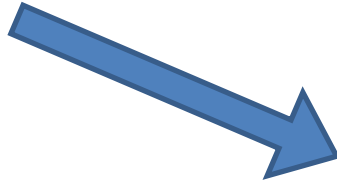
# Starry Stonewort Observations

General Location	SSW presence/ absence	Location Notes
Lake Couchiching, Washago, Severn	Present	Identification not confirmed by SSEA; Trent-Severn Waterway
Gloucester Pool, Severn	Absent	Trent-Severn waterway
Sturgeon Bay, Tay	Absent	Open water
Farlain Lake, Tiny	Absent	Inland Lake
Gloucester Pool, Georgian Bay	Absent	Trent-Severn waterway
North Bay, Georgian Bay	Absent	Open water
Midland Bay, Midland	Absent	Open water
Midland Bay, Midland	Absent	Open water
Moore Point, Georgian Bay	Absent	Open water
Sturgeon Bay, Tay	Absent	Open water

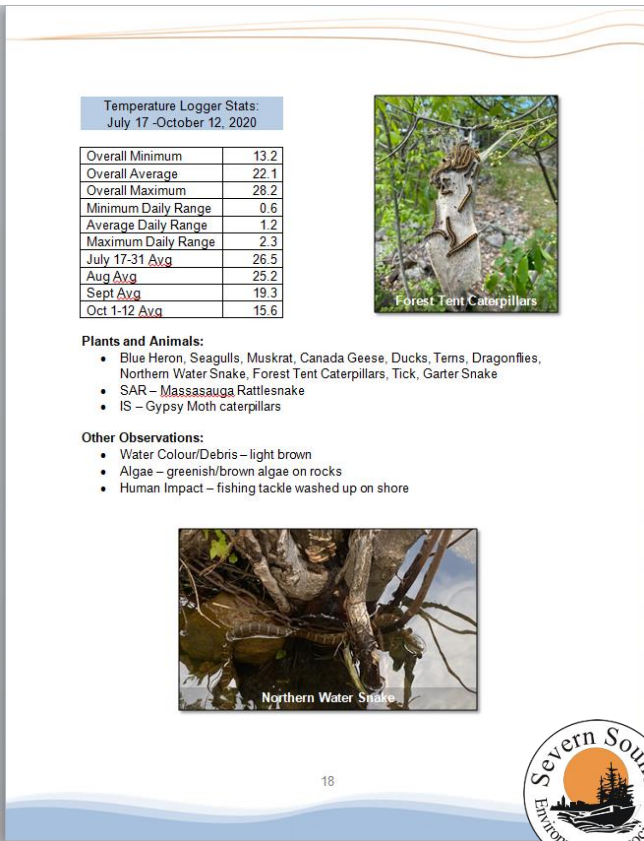
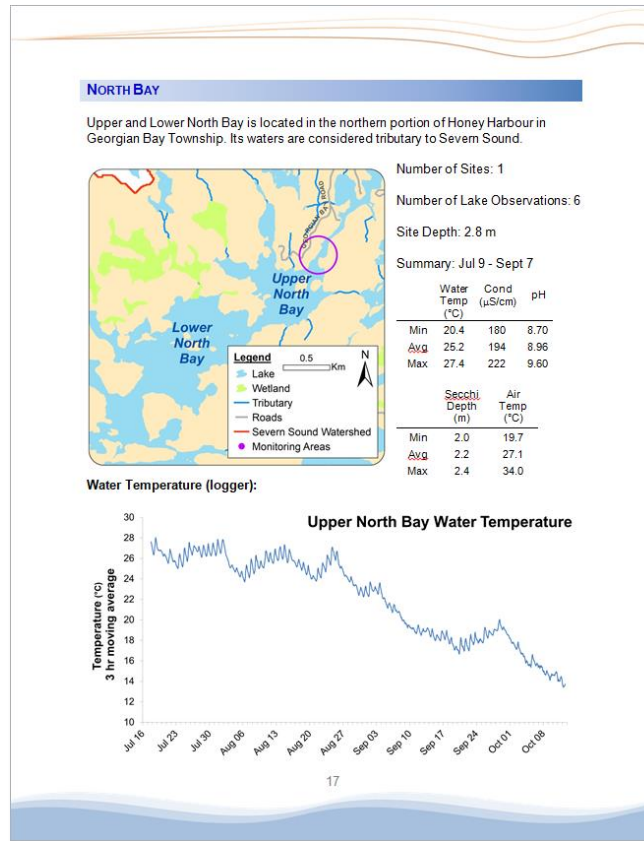


# Reporting

Shorewatch Site ID	Date	Time	Air Temperature	Water Temperature	Conductivity	pH	Cloud Cover	Precipitation within 24 hr	Rainfall in Rain Gauge	Beaufort Number	Wind Direction	Wave Direction	Secchi Depth	Site Depth
SWXXX	DD/MM/YYYY	HH:MM AM/PM	°C	°C	µS/cm		%	Y/N	mm	0-12	compass degrees, 0-360°	compass degrees, 0-360°	m	m
SW003	07/08/2020	16:00	15.0	8.2	235	7.90	20	N	2	3	300	270	3.2	5
SW003	09/08/2020	15:30	26.7	24.8	275	8.30	10	Y	2	2	360	360	4.6	5
SW003	11/08/2020	15:30	27.3	25.7	279	8.32	60	N	0	2	135	360	4	5.2
SW003	16/08/2020	12:30	23.5	24.7	305	8.12	100	Y	2	1	180	360	2.5	4
SW003	23/08/2020	12:00	25.5	25.1	325	8.17	40	N	1	1	225	360	4.5	4.5
SW003	30/08/2020	13:20	19.0	19.8	360	7.99	10	Y	95	1	330	360	4.5	5
SW003	06/09/2020	11:30	19.2	18.7	388	8.05	20	Y	31	1	350	10	5	5.3
SW003	13/09/2020	12:00	19.4	18.6	337	8.21	50	Y	20	1	260	10	3.75	4

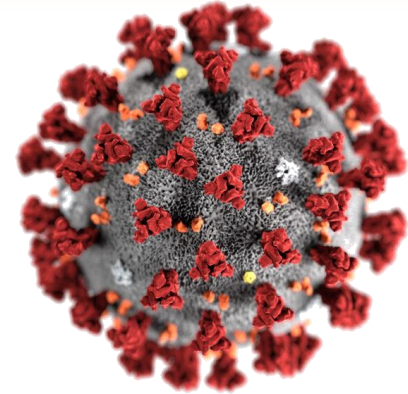


Full report will be available at:  
[bit.ly/sseacit-sci](https://bit.ly/sseacit-sci)



# Challenges

- The pandemic!!
  - Virtual training sessions
  - Kit delivery/return
  - Training opportunities
- Data entry – different submission methods required based on tech capabilities
- Equipment maintenance (Hanna meters)
- Lost communication with some volunteers
- Data inconsistencies
- Misidentification of IS



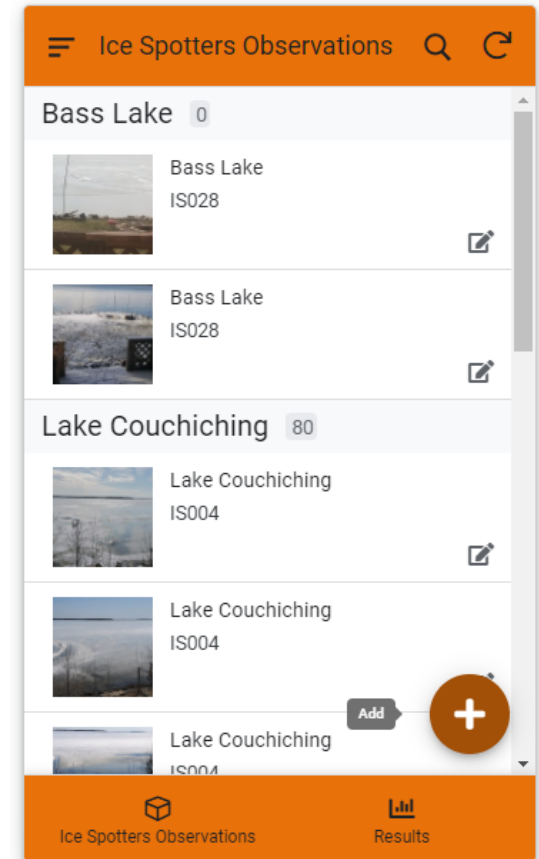
# What's Next?

## Short Term

- Purchase additional equipment
- Continue to spread the word & recruit volunteers
- Explore the use of apps for data input
- Update training materials to improve clarity
- Host Volunteer Check-in throughout the summer to engage with volunteers
- Provide educational webinar opportunities

## Long Term

- Explore methods for other monitoring areas of interest (invertebrates, bacteria, phosphorus)
- Explore potential for other citizen science program areas and integration with programs run by other agencies





# Thank You to our Funders!



**TD Friends of the Environment Foundation**

\$8,000 (2021)  
\$4,625 (2019/20)

Invasive Species Centre



Centre des espèces envahissantes

\$1,000 (2021)



**Lake Huron - Georgian Bay Watershed**  
*A Canadian Framework for Community Action*

\$3,487 (2021/22)  
\$7,500 (2019/20)



**WWF Supported Project**



presented by  
**TELUS**

\$5,000 (2017)

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**\$29,612 Total**



**Tiny**  
TOWNSHIP OF/CANTON DE



Township of **Oro-Medonte**  
Proud Heritage. Evolving Future.

