



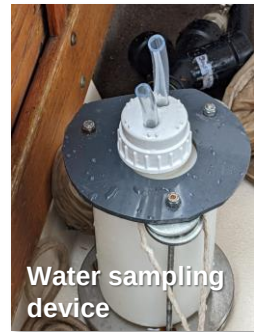
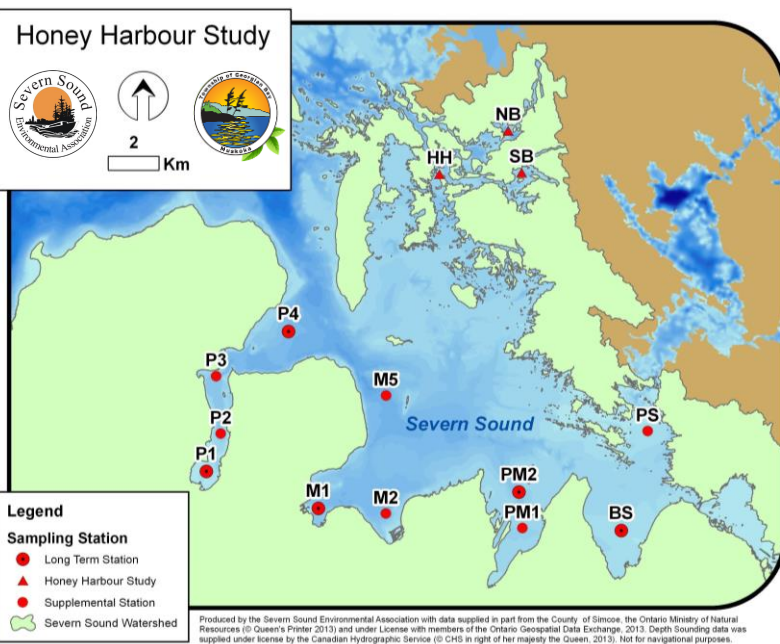
HONEY HARBOUR & PORT SEVERN

2022 WATER QUALITY UPDATE

Purpose of Monitoring

To collect water quality data in a consistent way that allows us to answer questions such as:

- Are temperature, bottom water oxygen and nutrient conditions changing in the Honey Harbour area? How do they compare to Severn Sound Remedial Action Plan targets?
- Is there an accumulation of nutrients and metals in the bottom waters of North Bay and South Bay that may be fueling algae growth?
- Are algae communities changing? Are algae growing in the water column that are of concern?



Sampling Locations:

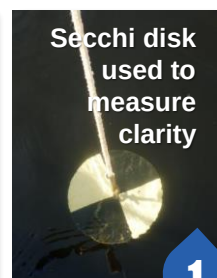
- North Bay (NB) plus 1m off bottom
- South Bay (SB), plus 1m off bottom
- Honey Harbour (HH)
- Port Severn (downstream of lock system) (PS)
- Open Water reference (M5)

Measurements & Samples Collected:

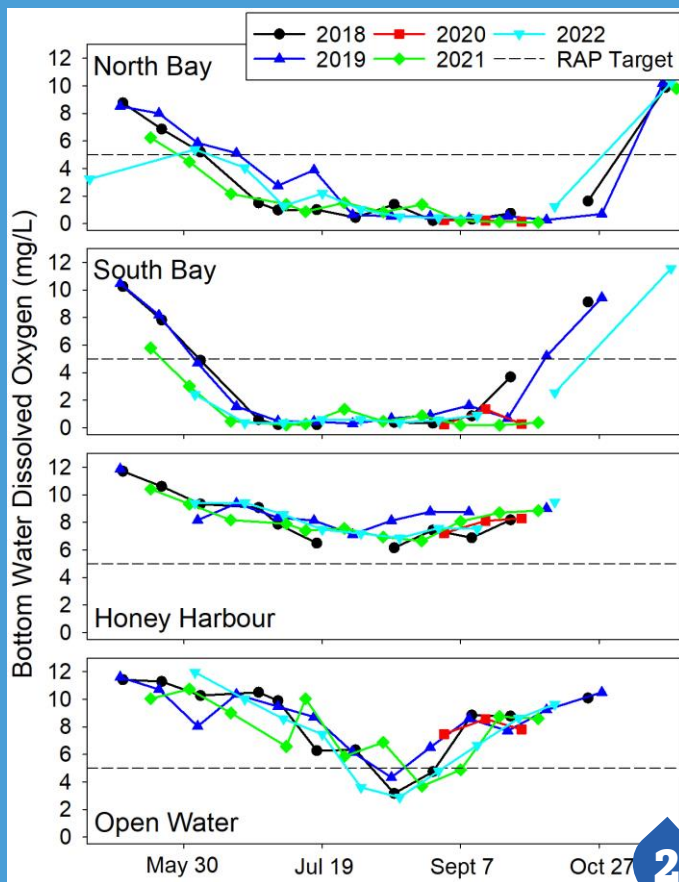
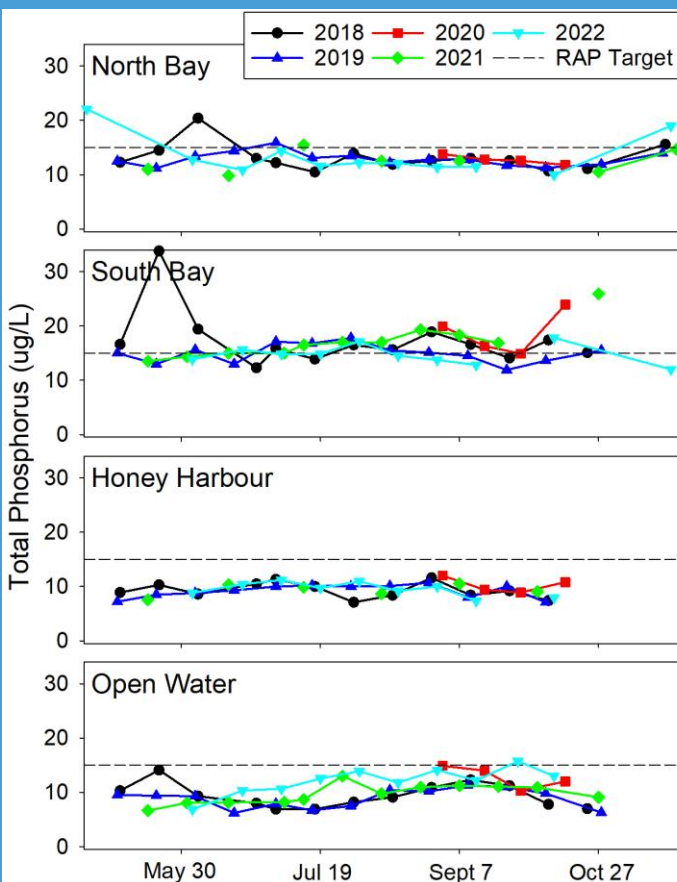
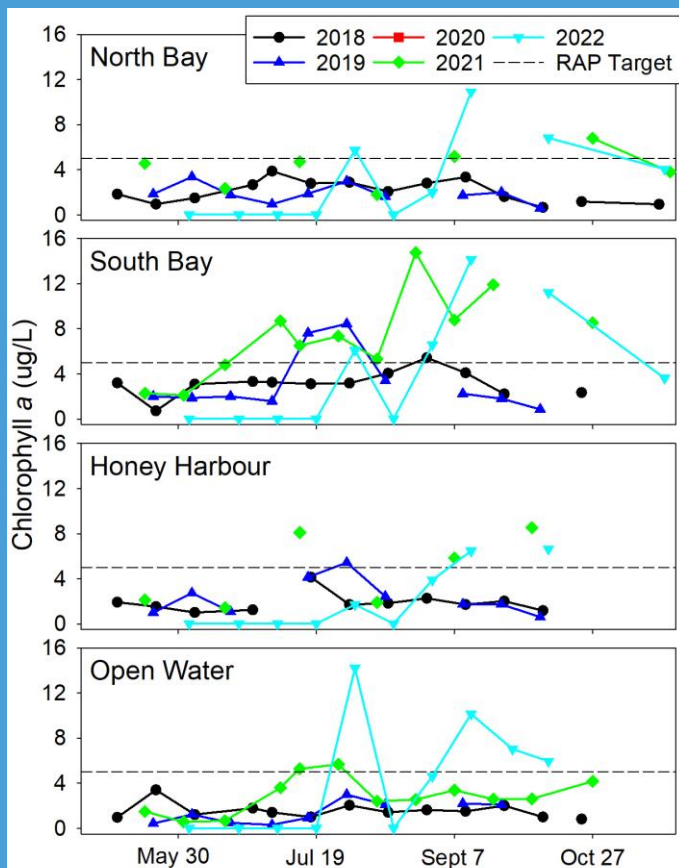
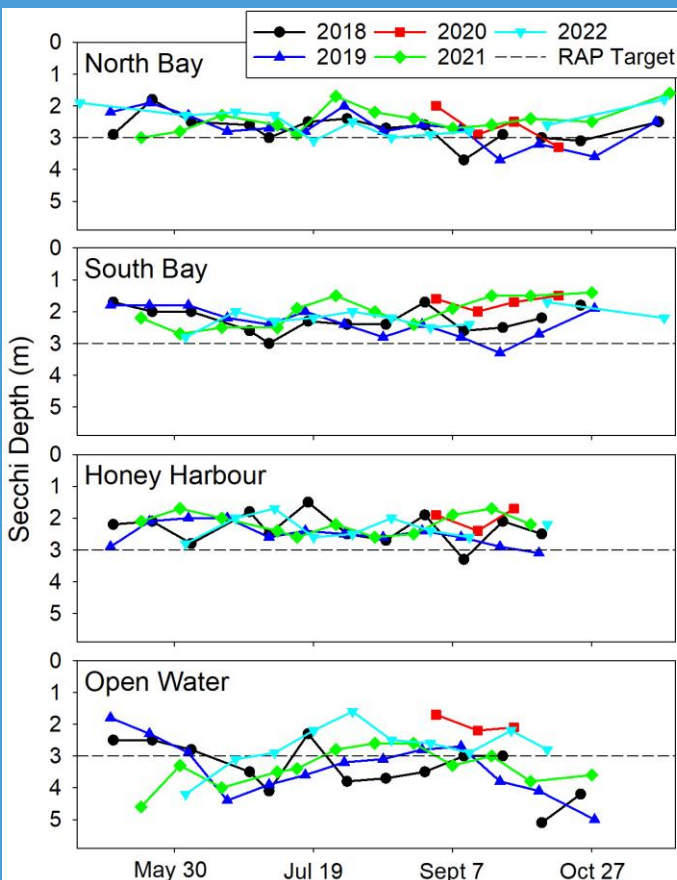
- **Physical** – water clarity, depth profiles of temperature, dissolved oxygen, turbidity, and conductivity
- **Chemical** – general chemistry, ions, nutrients (e.g., Ammonia, Nitrate, Total Phosphorus), heavy metals (all sites except HH and PS)
- **Biological** – chlorophyll a, algae (identification and biovolume), zooplankton (identification, density, biomass)

Date Range & Frequency:

- Biweekly from Jun 3 - Oct 11, 2022, plus Apr 26 at NB and Nov 22 at NB/SB to catch fully mixed conditions

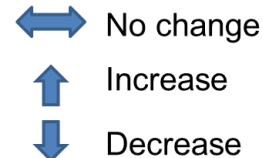


SEASONAL WATER QUALITY TRENDS, 2018-2022



LONG TERM WATER QUALITY TRENDS

	North Bay	South Bay	Honey Harbour	Port Severn	Open Waters
Phosphorus (P)	↔	↔	↔	↔	↔
Nitrogen (N)	↓	↓	↓	↓	↓
Water Clarity	↓	↓	↓	↔	↓
Chlorophyll a	↔	↔	(insuff. data)	(insuff. data)	↔
Algae	↔	↑	↑	↑	↔
Min. O ₂ at 1m off bottom	↔	↔	↔	↔	↔



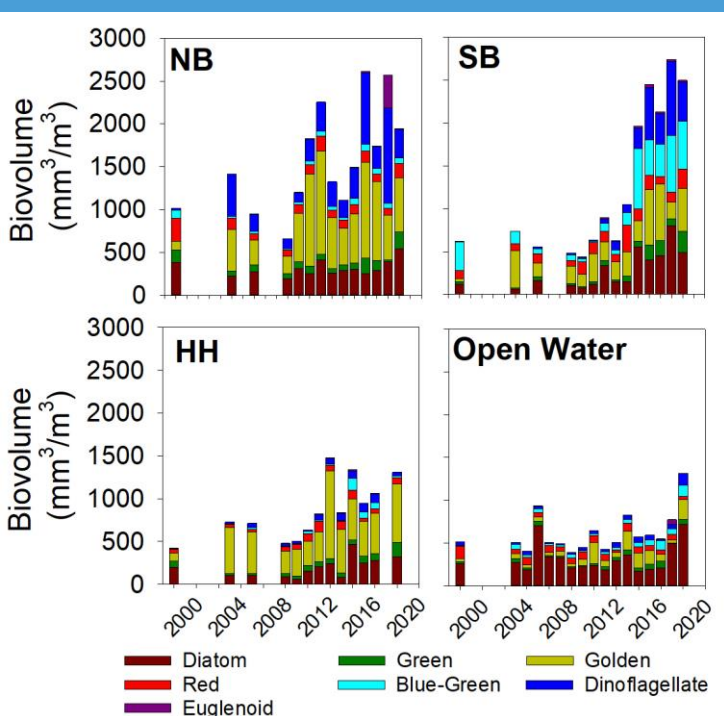
Results based on Mann-Kendall trend tests. Positive or negative trends are statistically significant.

Temperature and Oxygen

- Water column in NB and SB becomes thermally stratified each year, cutting off the bottom waters from the more oxygenated surface waters.
- Dissolved oxygen (DO) reaches anoxic levels (<2 mg/L) by mid-summer each year in the bottom waters of NB and SB, and also at mid-water column in NB. This anoxia has not worsened.

Water Quality

- Low oxygen causes phosphorus, ammonia and some metals (e.g. iron) to accumulate in a narrow zone above the lake bed at NB and SB beginning in mid-summer. This internal nutrient loading fuels algae growth.
- Trends in nutrients shows P has remained stable at all sites; N has decreased at all sites.
- Water clarity has decreased at all sites except PS.

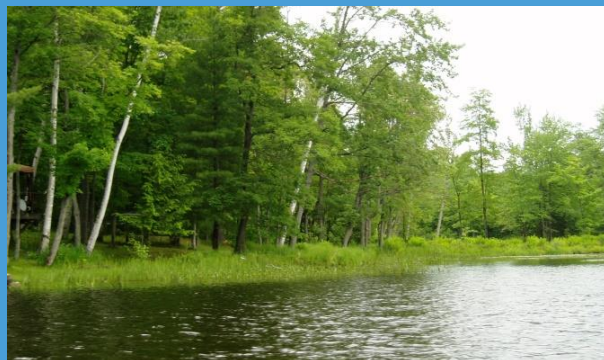


Algae

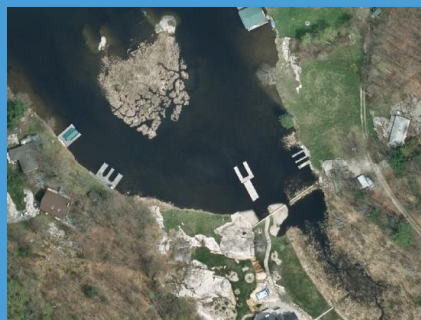
- Average total amount has been increasing in SB and HH; blue-green algae amounts in SB have increased.
- Blooms of the blue-green algae *Planktothrix*, *Anabaena* and *Aphanizomenon* occur in deep water at SB (4-9 m). These have the potential to produce toxins.
- The chrysophytes *Peridinium wisconsinense* and *Chrysosphaerella brevispina* bloom at specific depths (4-5 m) for short periods over the season at NB. These species can produce compounds that lend an offensive taste and odour to water but are not harmful.

KEY STEWARDSHIP ACTIONS – What YOU Can Do!

1. Talk to your neighbours. Focus on common values (the lake you both enjoy) and shared goals (wanting to protect it for future enjoyment). Talk about solutions and share resources and information.
2. Maintain your septic system with regular pump-outs and inspections (approximately every 3-5 years, depending on use), and reduce septic output by using efficient water fixtures and minimizing water use. Don't forget – water may be plentiful at the cottage, but the lake's ability to handle the resulting wastewater has its limits. Use phosphate-free detergents, personal care and household cleaning products. Don't put anything down the drain that may harm the bacteria that keeps your septic system working properly.
3. Eliminate use of fertilizers, particularly those containing phosphorus, and especially within 100 m of the shoreline. Get creative in reducing the amount of lawn on your property. Mosses make a great ground cover in shady areas. The less lawn you have, the less there is to mow, and the more time you have to enjoy the lake!
4. Maintain a natural shoreline (minimal or no lawn, wide buffer of native shoreline plants). Look around at nearby natural areas and try to mimic them as much as possible. Well placed trees and shrubs go a long way in stabilizing shallow soils, and if purposefully trimmed, will not obstruct views of the lake.
5. Reduce runoff and soil erosion by planting or maintaining vegetation in vulnerable areas such as adjacent to cleared pathways and on steep hills. Minimize the amount of impervious surfaces such as paved driveways and walkways on your property.
6. Encourage native rooted aquatic plant growth along the shoreline to help with phosphorus settling and uptake. Aquatic plant communities also provide nursery habitat for fish.
7. Do not restrict natural water circulation around docks etc. Use pipe or floating docks, which also have the advantage of being more easily adaptable to fluctuating water levels.



Natural shorelines provide critical habitat, filter runoff, and buffer the effects of water level fluctuations.



Contrasting shorelines – examples of properties where lawns are maintained right to the water's edge, with little to no vegetation buffer, compared to properties with more intact upland forests and shorelines (Aerial imagery source – Ministry of Natural Resources and Forestry, 2018).