The Lake Partner Program: Long Term Trends and Next Steps

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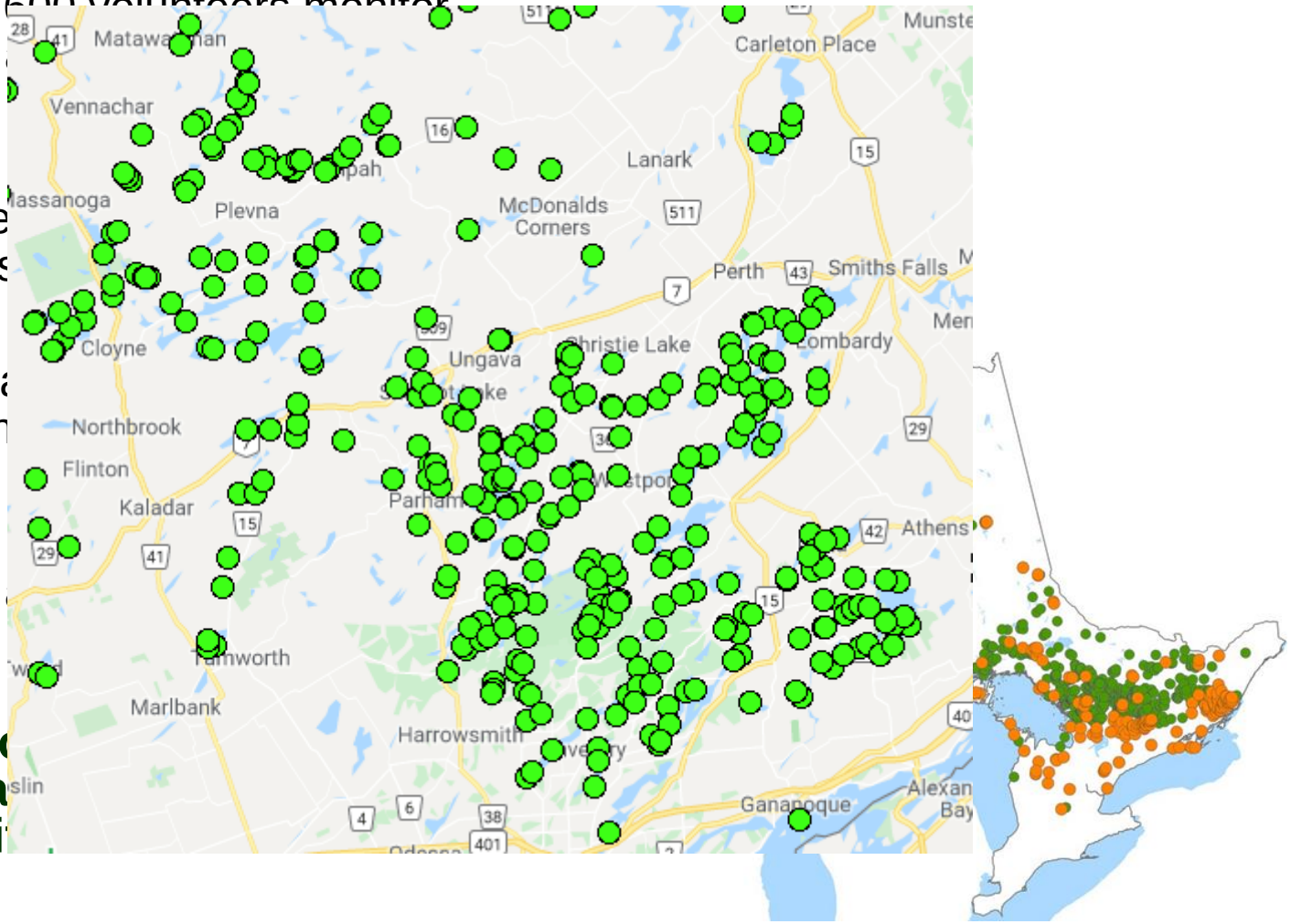
Lake Partner Program

- Each year, > 600 volunteers monitor water quality at lakes at over
- Volunteers se DESC chemis
- Data are upda annually onlin
- Data used to water quality

Largest vo water qua program of i



What we measure, and why

Total Phosphorus (TP)

- Important nutrient controlling the growth of algae in Ontario Lakes

Water clarity

- Estimated using a Secchi Disk

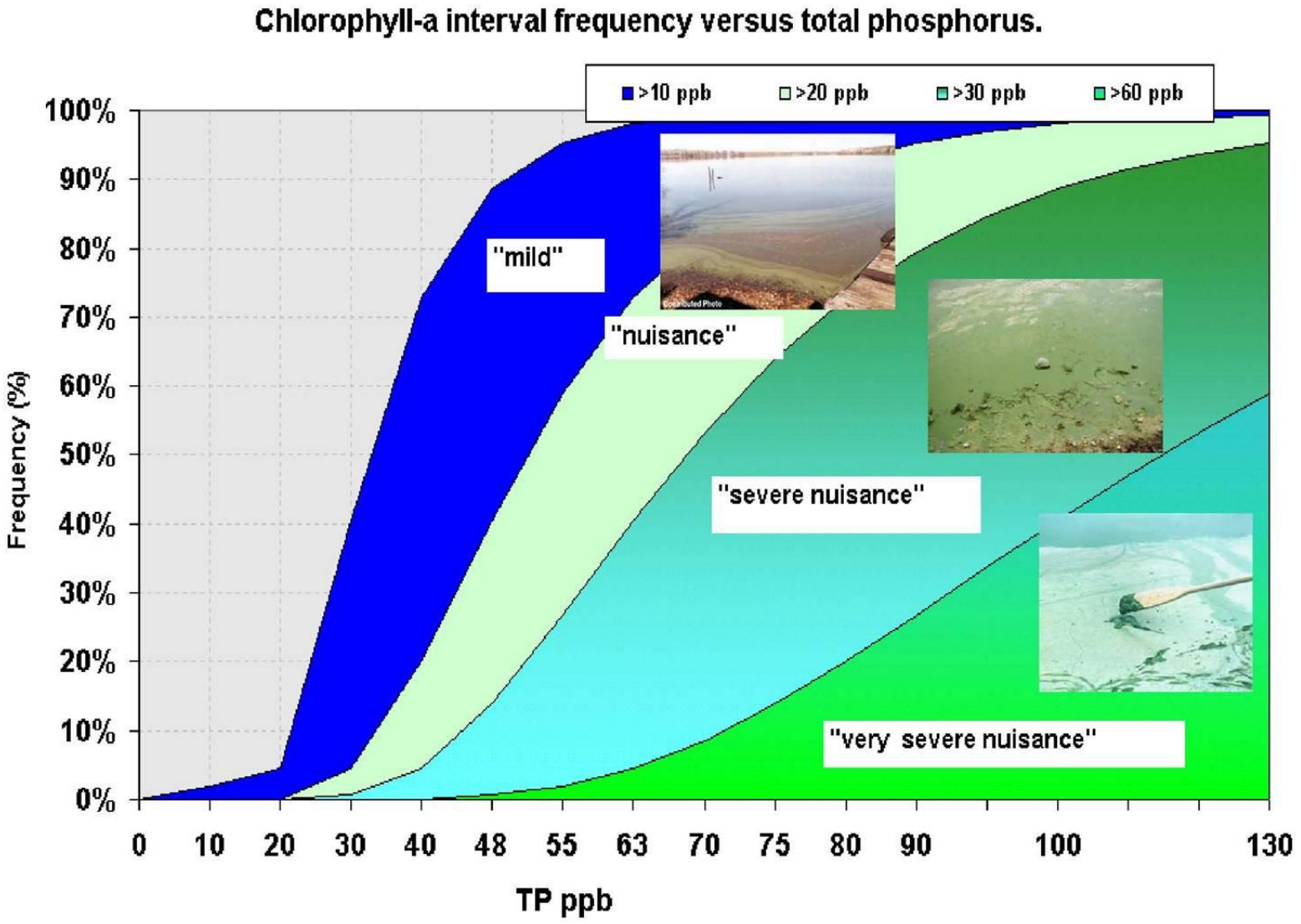
Calcium (since 2008)

- Essential element that is required by all living organisms

Chloride (since 2015)

- There have been increases in chloride concentrations across the province due to road salt

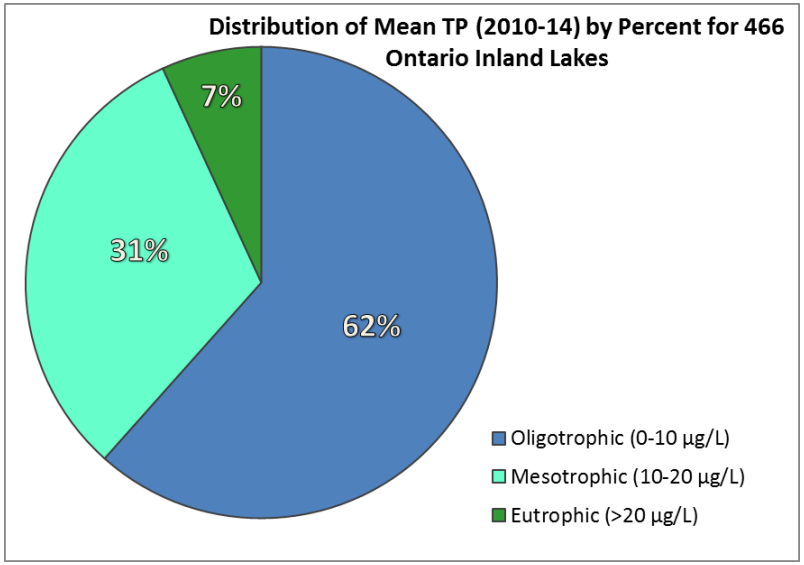
Total Phosphorus

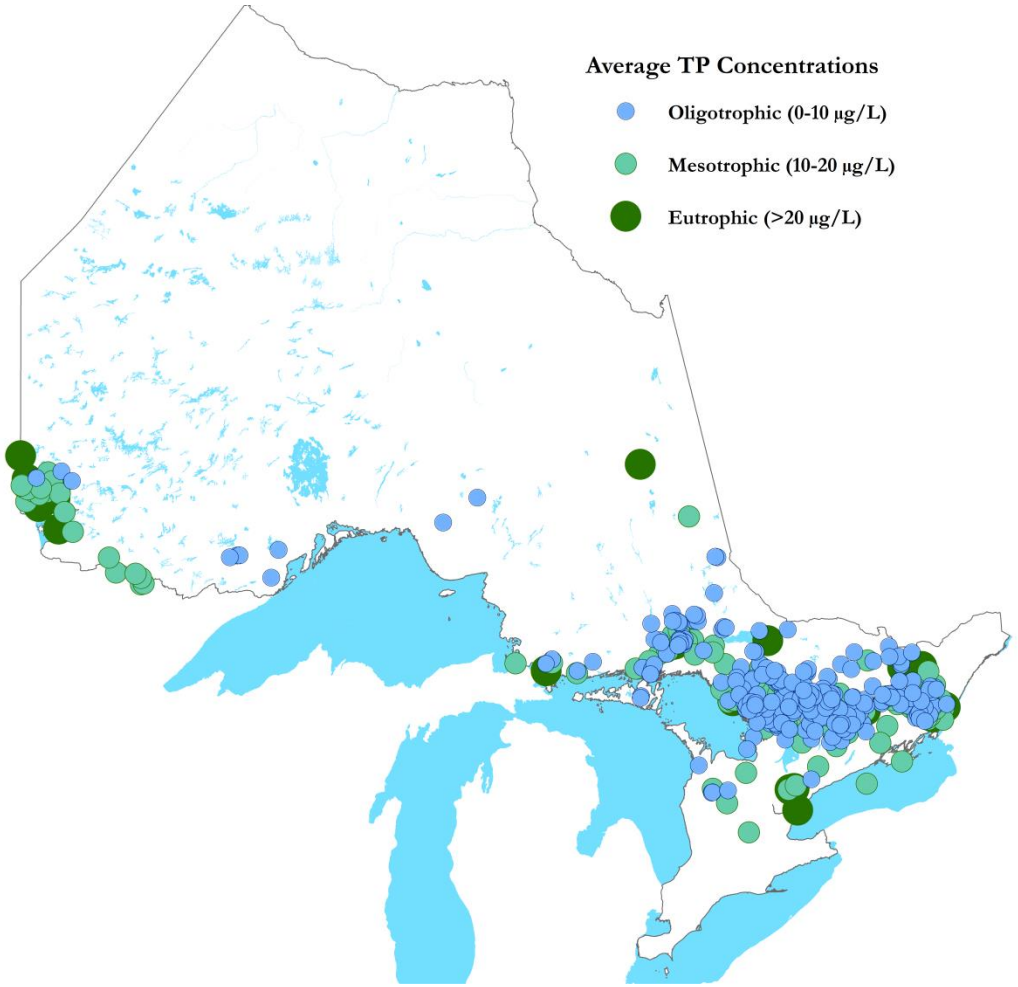


Total phosphorus controls the growth of algae in most Ontario lakes

Total Phosphorus – Current status (LPP lakes)

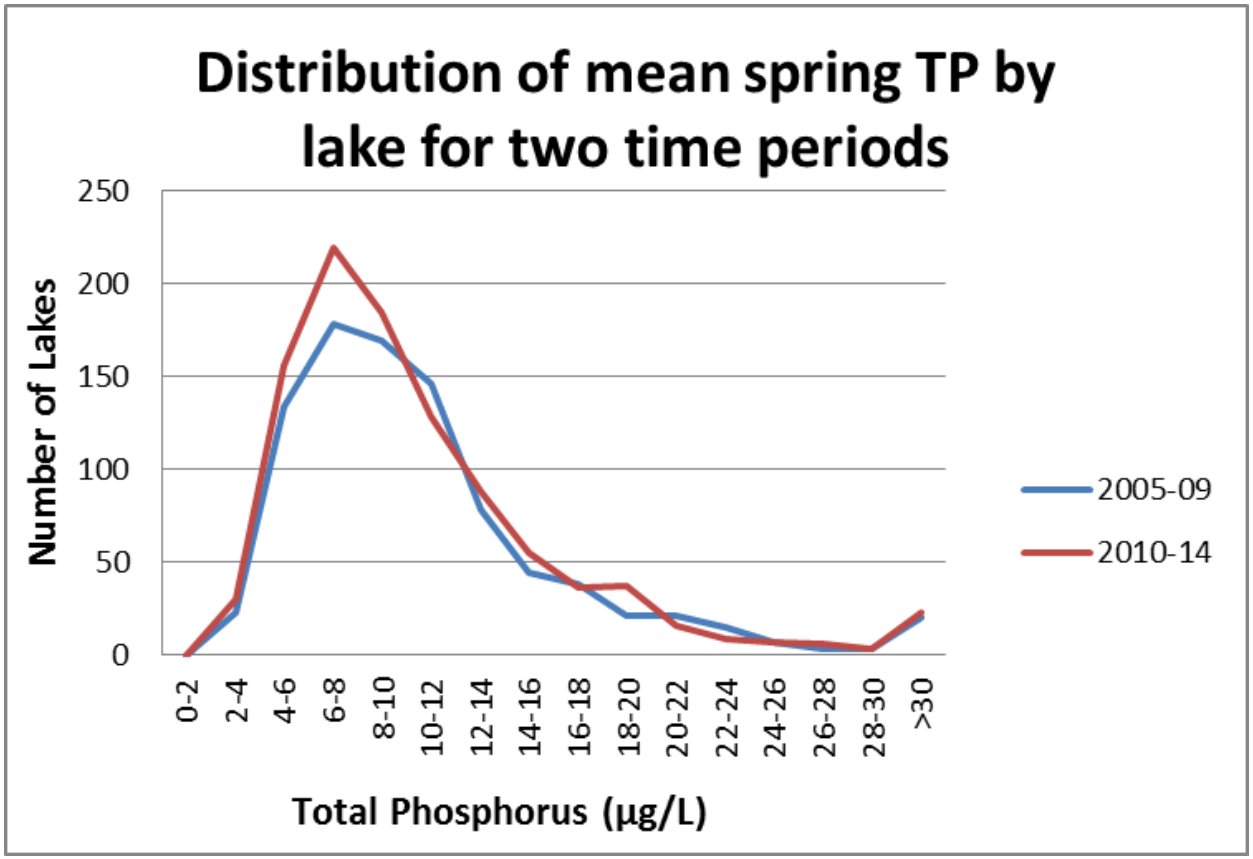
- **93% of inland lakes in the Lake Partner Program meet the PWQO objective**





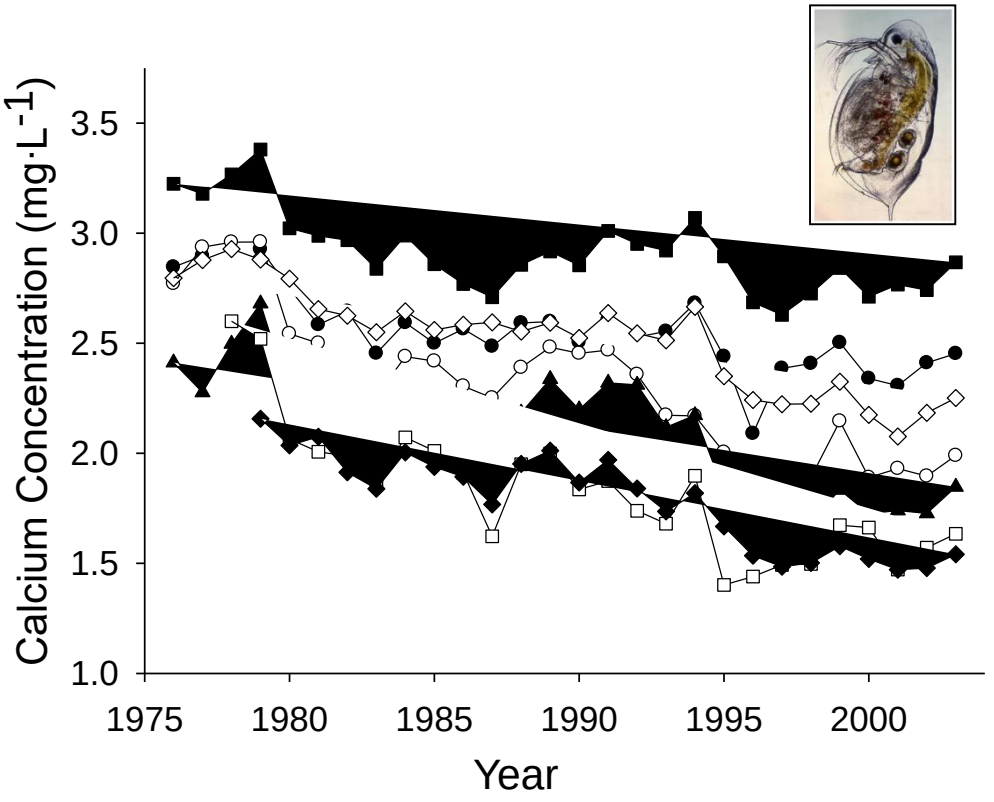
Total Phosphorus – Change over time?

- **At a landscape scale, TP concentrations have not changed significantly over the last ~ten years for LPP lakes**



Calcium (Ca) – Long-term declines in recent decades

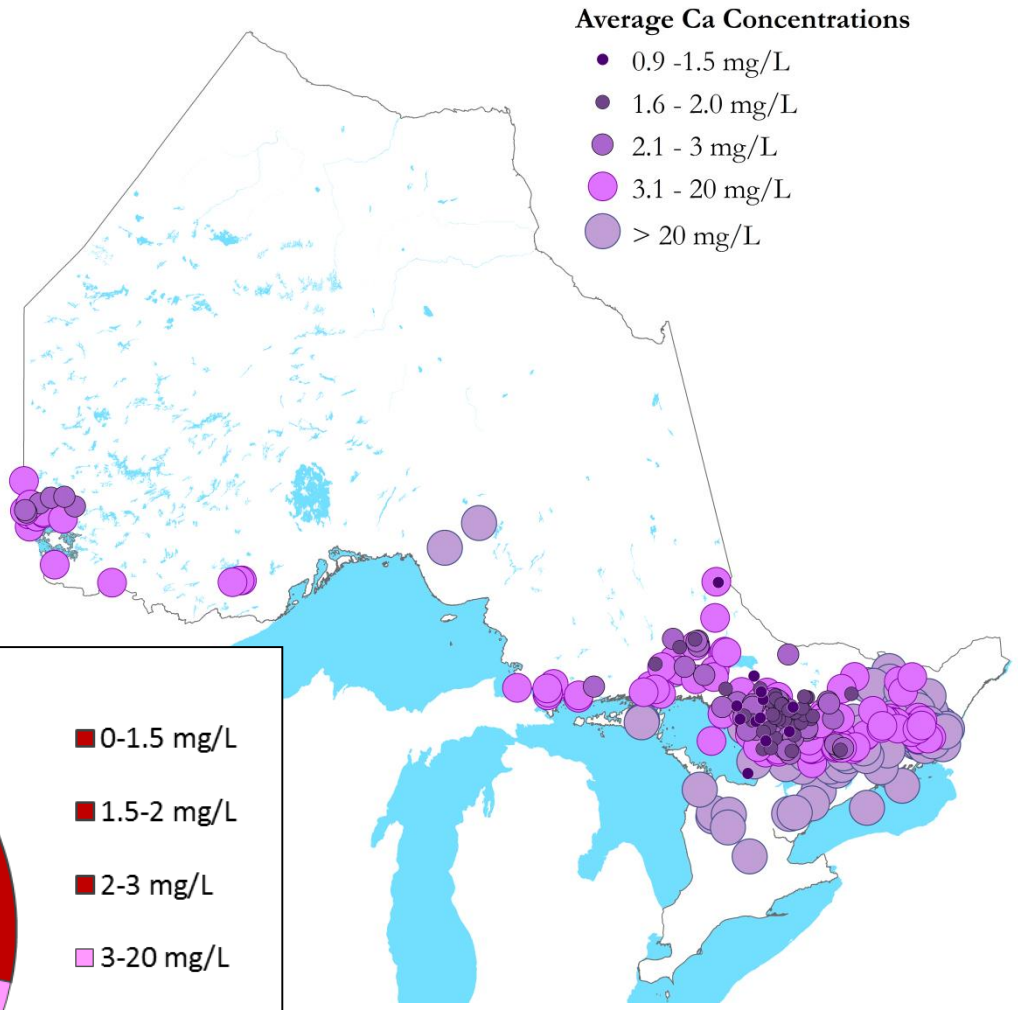
- Ca levels have been declining in Ontario inland lakes
- Main causes are historical acid deposition (acid rain) and biomass loss through timber harvesting
- Recent laboratory and field experiments have shown that when Ca levels fall below 1.5-2 mg/L, aquatic organisms may be negatively affected
- The LPP has been monitoring Ca since 2008

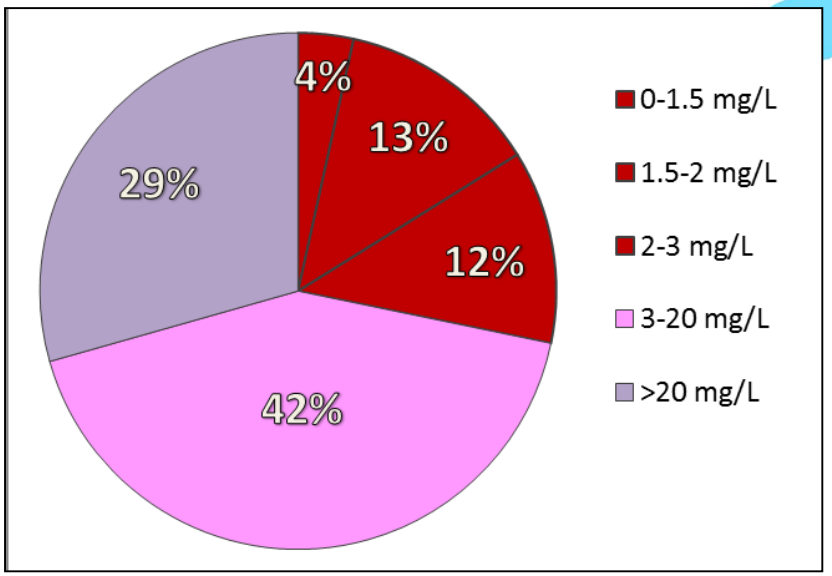


Calcium – Current status

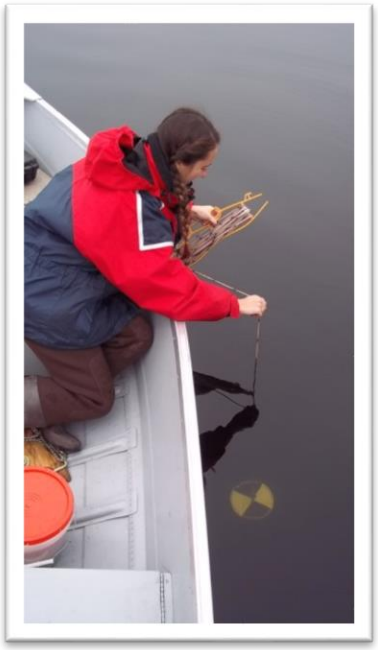
- The majority of LPP lakes in Ontario have Ca levels that can support calcium-rich aquatic organisms

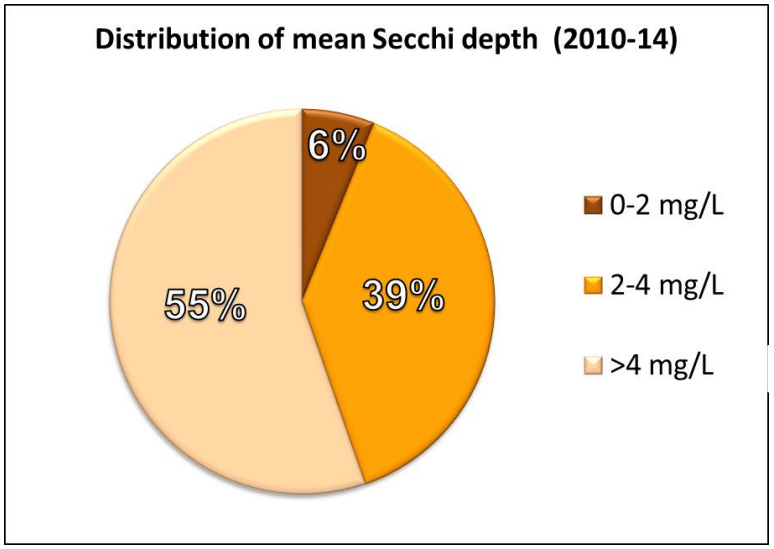
- But, ~15% of lakes are at Ca concentrations that may hinder the reproduction and survival of some Ca-rich organisms (< 2.0 mg/L)

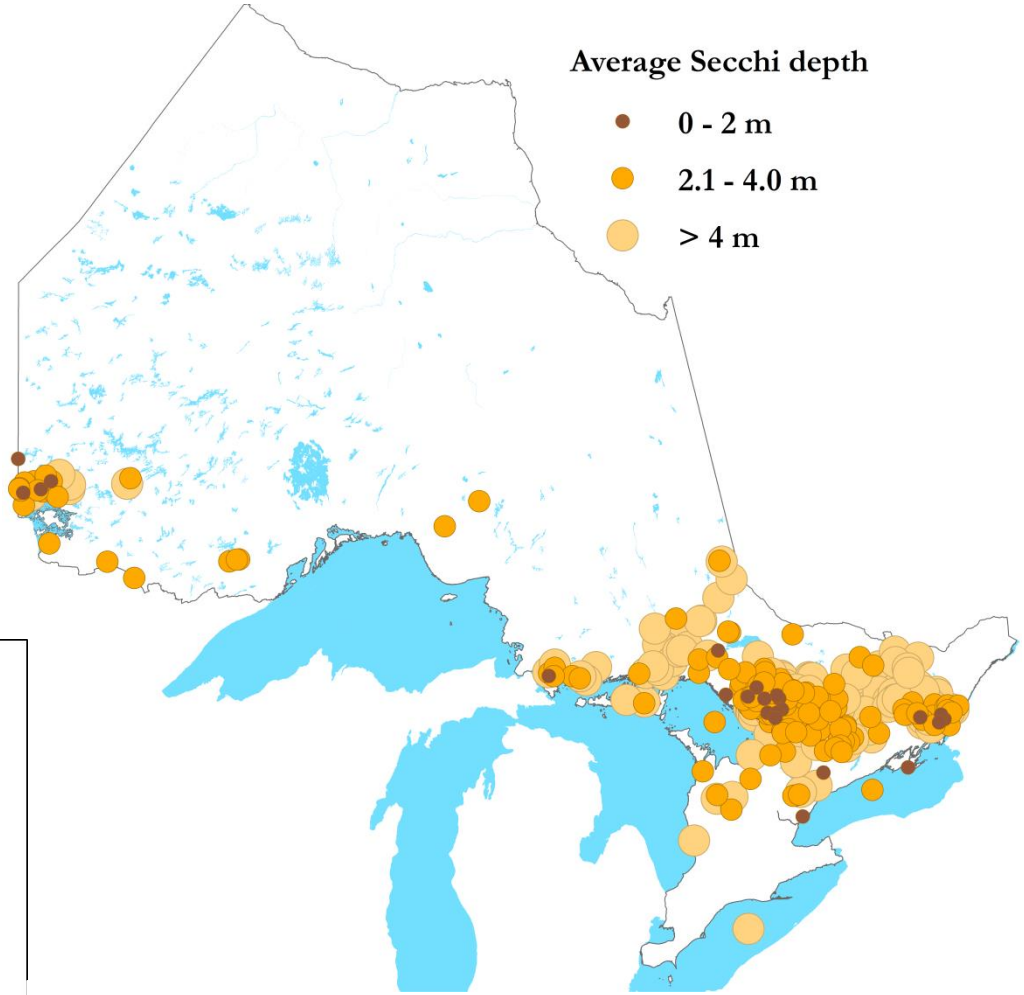




Water clarity – Current status

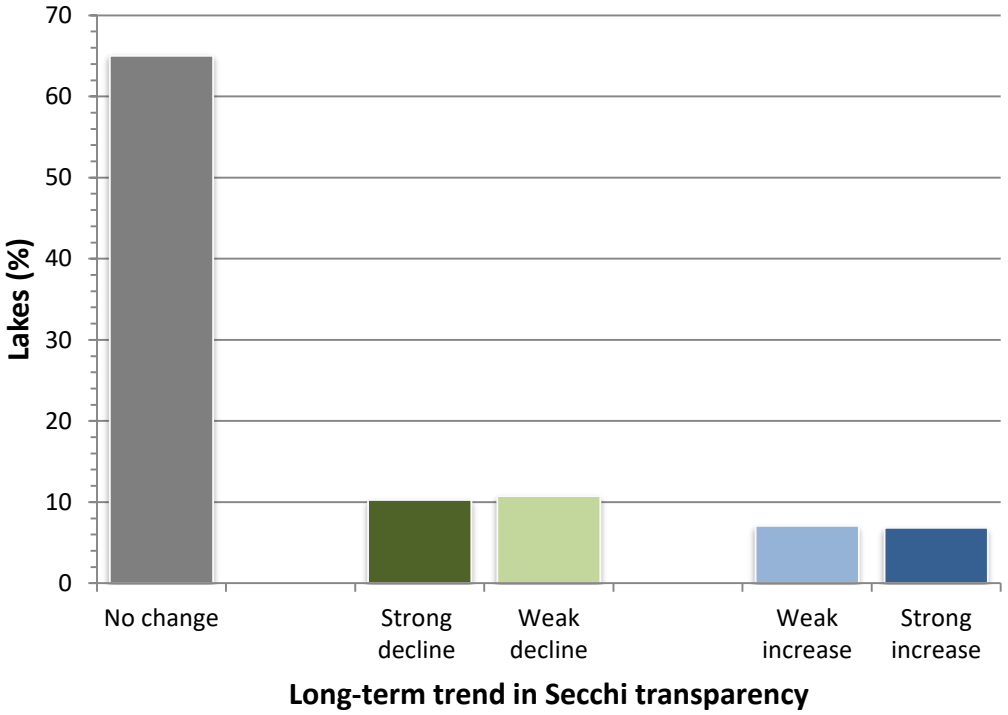






- Regional distribution of LPP lake water clarity (Secchi) across Ontario. Trends correspond with geological factors that would influence water clarity.

Water clarity – Change over time (2000-2014)



Download "***Secchi Trends Across the Province***" at www.foca.on.ca/lake-partner-program-sampling-assistance/

- Most lakes (65%) show no significant change in Secchi from 2000-2014
- ~21% of the lakes show a decline in water clarity over time (lakes becoming less clear)
- This could be due to long-term increases in dissolved organic carbon (DOC) – lakes are becoming more tea-stained in appearance

Chloride

- **Lake salinity is potentially increasing due to road salt**
- **Runoff could be an issue for lake health**
- **LPP beginning to analyze for chloride in Ontario lakes; dataset will help watch for trends**

LPP Volunteer Survey 2016

- Electronic survey sent out in Jan, 2016 using web-based survey platform.
- Received a good response rate (70%).

Thanks to any volunteers in the audience who took the time to fill this out!

Survey Highlights

"This program has helped me get involved in our community, as it has provided me with the resources and information I needed to get started. I felt helpless as one waterfront property owner but being involved in the Lake Partner Program, I feel empowered and not alone in monitoring the health of lakes in Ontario"

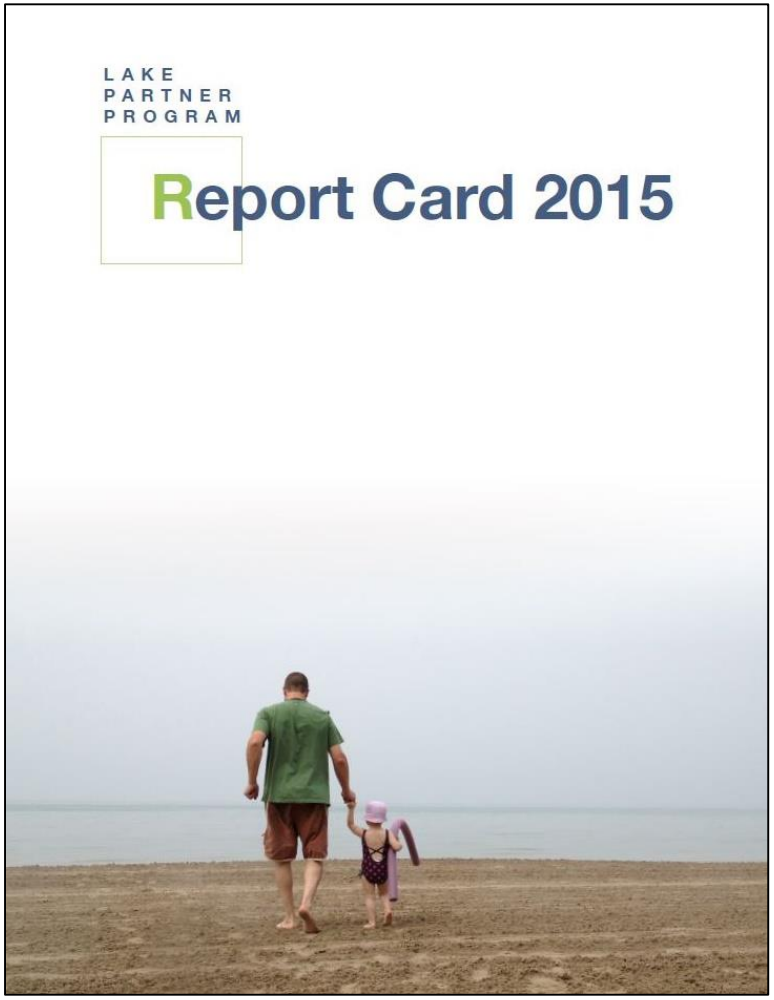
"They're not making lakes anymore....."

"Being a LPP volunteer means that you have a reason to regularly spend some quiet time on your lake and at the same time do something meaningful for your lake."

"If we don't have data about what is happening in our lakes how do we know what is needed and whether any of the efforts that we undertake are having any effect."

Data Delivery

- Survey of volunteers showed a desire to understand how the LPP data are used
- Lake Partner Program **Report Card** released in 2016
- Summarizes the current state of water quality in 350-450 volunteer-monitored lakes across Ontario
- Ongoing communications from DESC, and from FOCA (newsletters, Elerts)



www.desc.ca

Where is the LPP Data Being Used?

- Study conducted in 2014 by Clapper and Caudill
- Using modeling techniques with LPP data, found that 1-foot increase in water clarity as measured by Secchi depth is associated with about a 2% increase in cottage value

Where is the LPP Data Being Used?

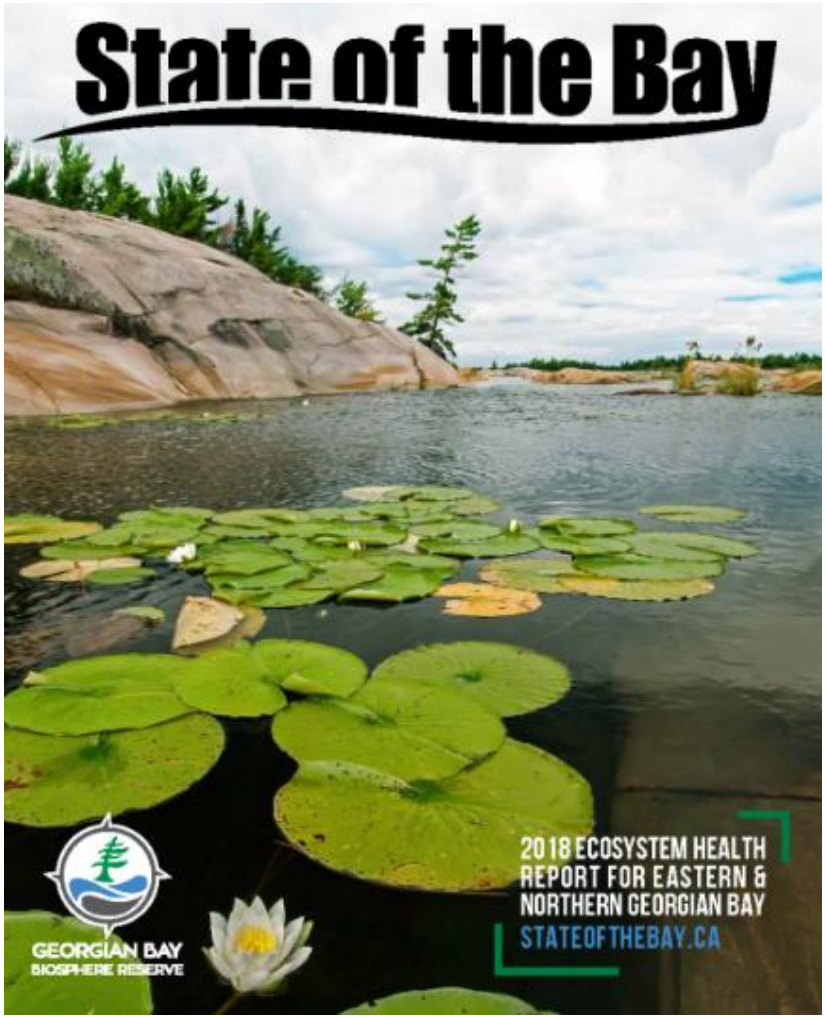
- Lakeshore Capacity Assessment
- Example: Tay Valley Township
  - increase lot size for new severances on both lakes to 0.8 ha (2 acres);
  - increase lot frontage on Farren to match Adam Lake's 91m frontage;
  - require new or replacement septic systems on both lakes to achieve maximum phosphorus removal

Lakeshore Capacity Assessment Handbook

Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield

Where is the LPP Data Being Used?

- Georgian Bay Biosphere Reserve
- 5 year report on the water, wetlands, fisheries, and habitats in Georgian Bay – shared with the public.
- Samples 39 LPP sites; data is used in report.



A Big Thank You to all of Our Volunteers

…for your dedication, your passion, and your sense of humour!