

Beyond Delisting in Severn Sound

How do things look 20 years after the party is over?

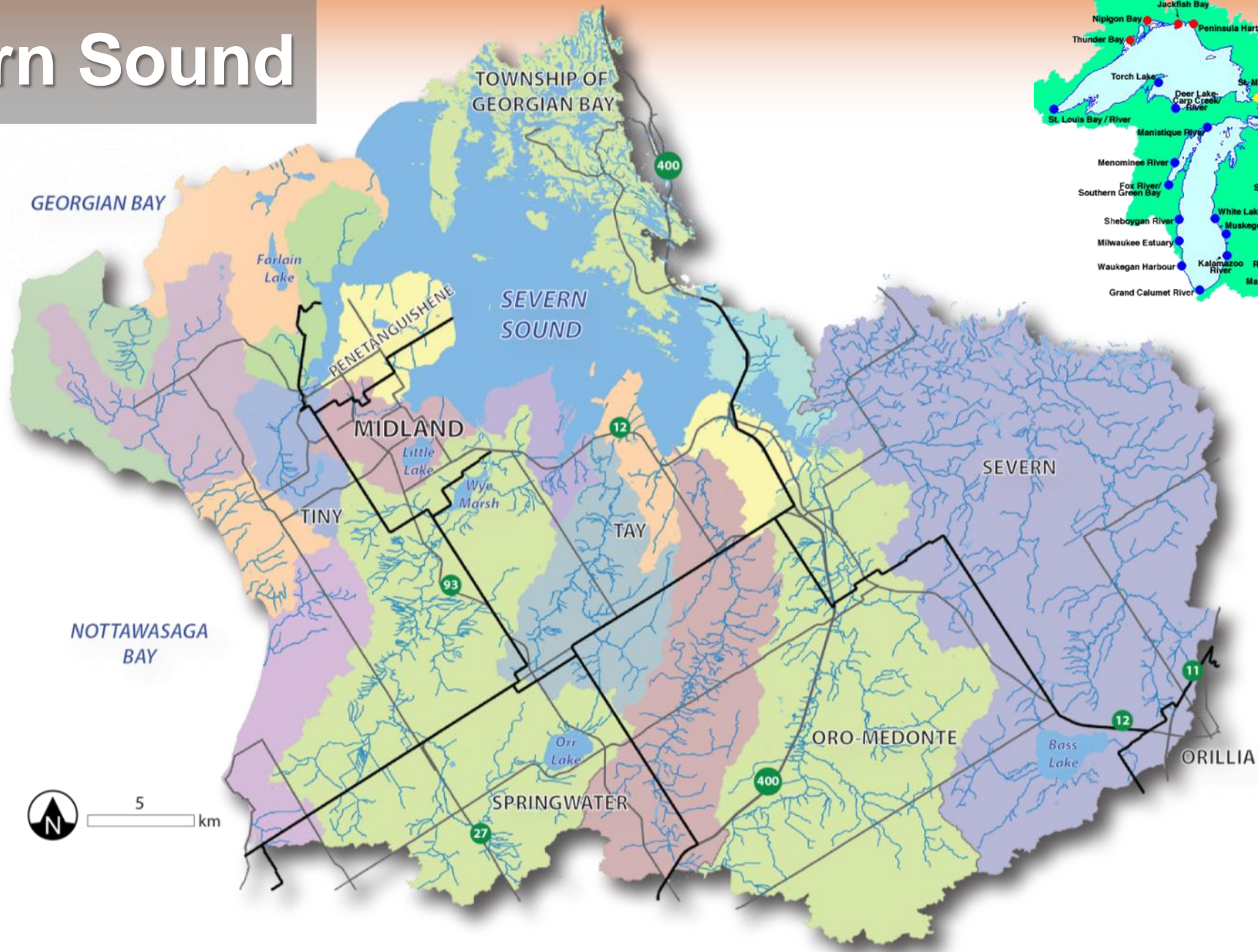


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Severn Sound



From AOC to SSEA

Environmental success of the RAP leads to municipal legacy commitment in the form of the SSEA & the JMSB

- **1986** - Severn Sound designated 1 of 43 Great Lakes Areas of Concern (AOCs), Remedial Action Plan (RAP) team established
- **1990** - RAP implementation began – federal/provincial initiative to address eutrophication and habitat loss
- **1997** - Severn Sound Environmental Association (SSEA) partnership b/t EC, MOE, municipalities to facilitate delisting
- **2003** - Canada formally announced the removal of the Severn Sound from the list of AOCs after Stage 3 Delisting Report accepted
- **2009** - **SSEA** becomes **Joint Municipal Service Board** (Municipal Act) - municipal leadership & obligation to maintain water quality improvements, continued protection & wise stewardship of the Severn Sound watershed



Algae in mouth of Wye R



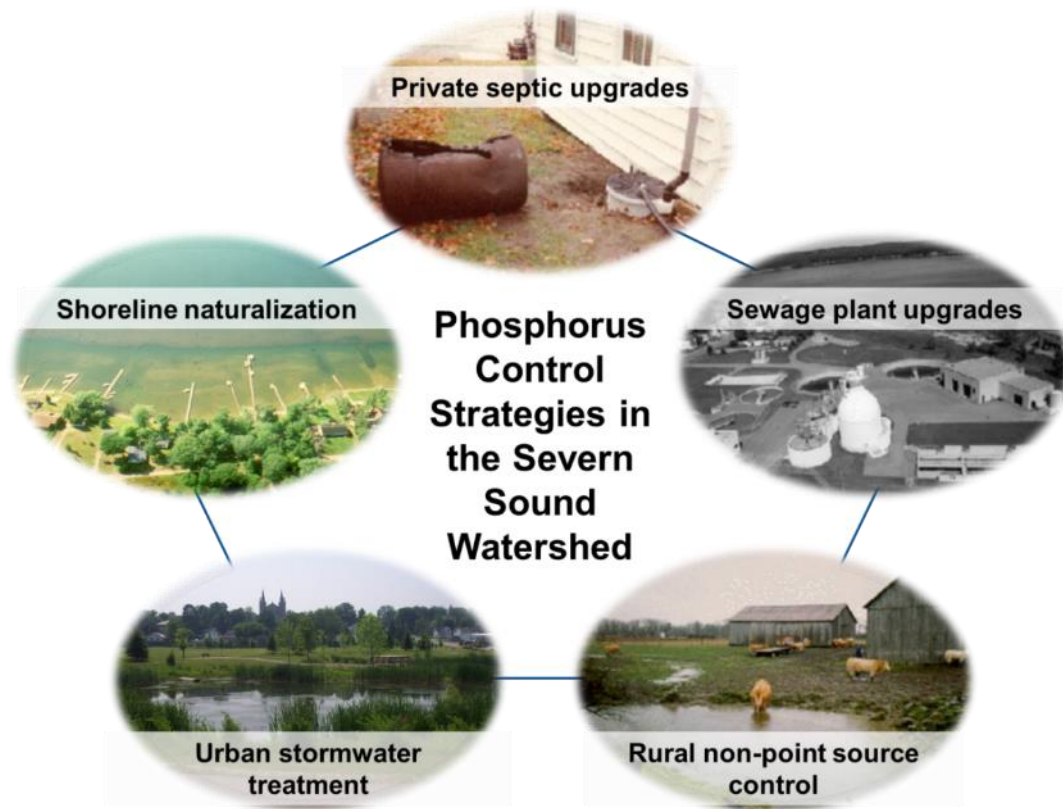
Tree planting a key to success



Creation of SSEA, 1997

Restoration Efforts

“Our overall effort and success is excellent and the RAP team should be commended. However, there is still life after delisting and we should proceed as if we were approved and passed but forever on probation, lest we become complacent.” (Bob Whittam, former PAC Chair, Wye Marsh Wildlife Centre)



20 Years Post Delisting - Assessment

Indicator
Phytoplankton
Drinking Water (Taste & Odour)
Beaches
Benthos
Dreissenid Mussels
Fish Consumption
Fish Population
Sediment
Land Cover
Tributary Water Quality
Open Water Quality
Zooplankton
Nutrient Loading – WWTPs

Data gathering – SSEA & partners

Assess the status and trend of specific metrics for each indicator category

- Incorporate Traditional Oral Knowledge to compliment indicator data
- Status = current data compared to indicator guidelines/ delisting criteria
- Trend = direction of indicator from 2003 to present as it relates to improving/deteriorating/unchanging conditions (Mann-Kendall)

Identify data/knowledge gaps

Recommendations – monitoring/restoration

State of Severn Sound 20 Years Post Delisting

Indicator	Current Status	Trend
Phytoplankton	Good	Undetermined
Drinking Water (Taste & Odour)*	Good	Undetermined
Beaches	Good	Deteriorating
Benthos (lake/trib)	Asses't in progress	
Dreissenid Mussels*	Asses't in progress	
Fish Consumption*	Fair	Unchanging/ Undetermined
Fish Population	Asses't in progress	
Sediment	Asses't in progress	
Land Cover	Fair	Undetermined
Tributary Water Quality	Fair	Undetermined
Open Water Quality	Fair to Good	Undetermined
Zooplankton	Poor	Undetermined
Nutrient Loading – WWTPs	Asses't in progress	

- Assessments are preliminary
- Limitations of some datasets affect ability to determine trends (*)
- Multiple metrics go into assessment of each indicator
- Other indicators to be considered that weren't in Delisting report
 - Invasive species, climate change

Land Cover

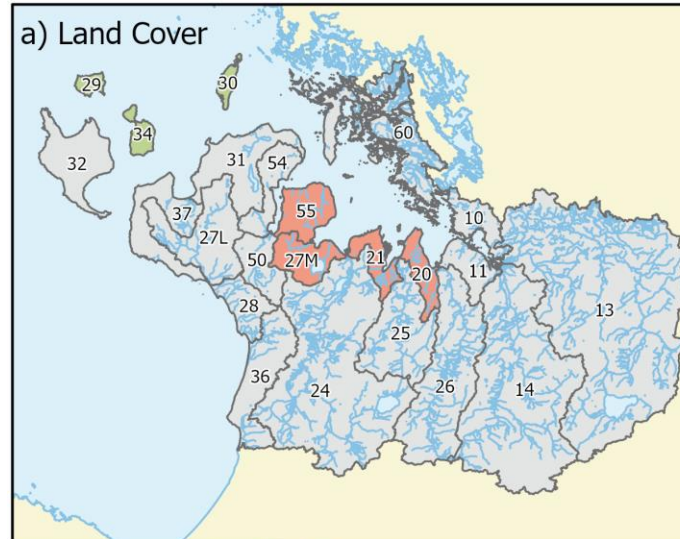
Delisting Impairment: Degradation of fish and wildlife populations & habitat

Status	Watershed		Riparian
	Agriculture	Settlement	Natural
Poor	> 50%*	> 27%*	< 30%
Fair	20 – 50%*	6 – 27%*	30 – 45%
Good	< 20%	< 6%	> 45 %

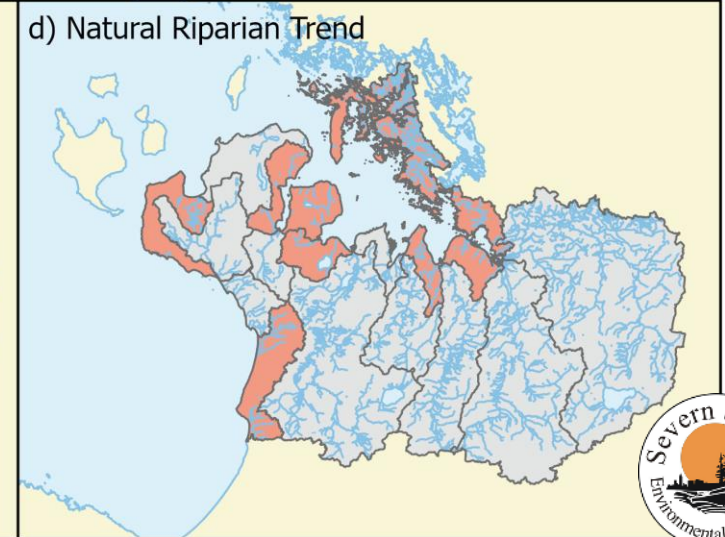
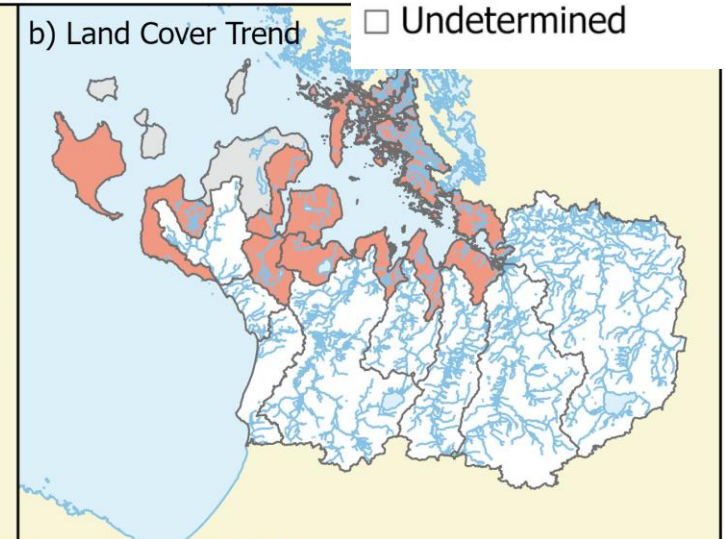
Natural land to anthropogenic land at 0.1% per year = deteriorating trend

Data Source: Agriculture and Agri-Food Canada

Status (2020):



Trend:



- Good/Improving
- Fair/Unchanging
- Poor/Deteriorating
- Undetermined



Beach Quality (E. Coli)

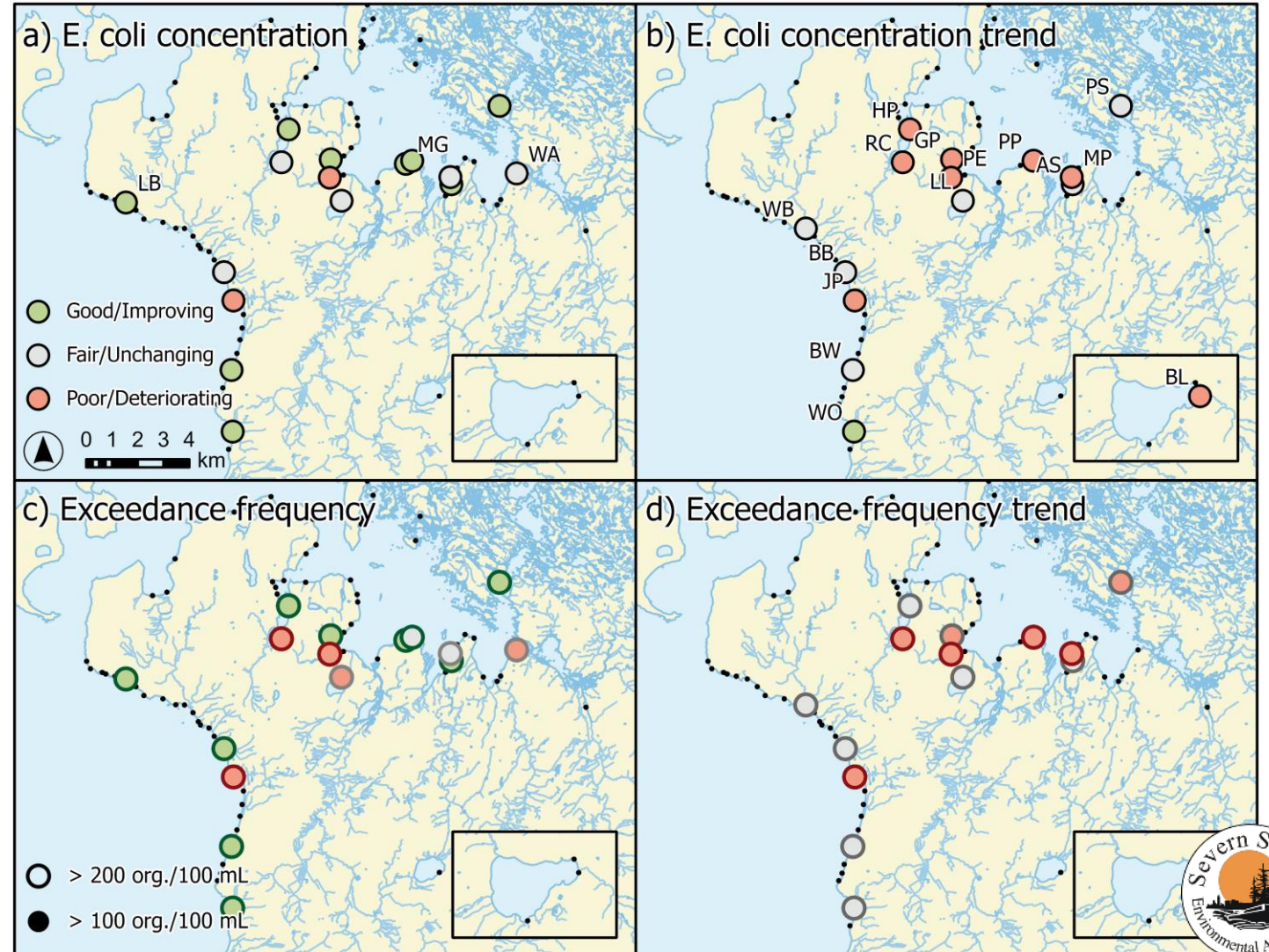
Delisting Impairment: Beach closures and degradation of aesthetics

E. coli Concentration
 Good < 40 org./100 mL
 Poor > 100 org./100 mL

Exceedance Frequency
 Good < 20%
 Poor > 30%

Status (2022):

Trend:



Tributary Water Quality

Delisting Impairment:

Eutrophication or undesirable algae

- Total P conc **<30 µg/L** and loadings ↓ **20%** for watershed inputs to Severn Sound

Good < 24 µg/L

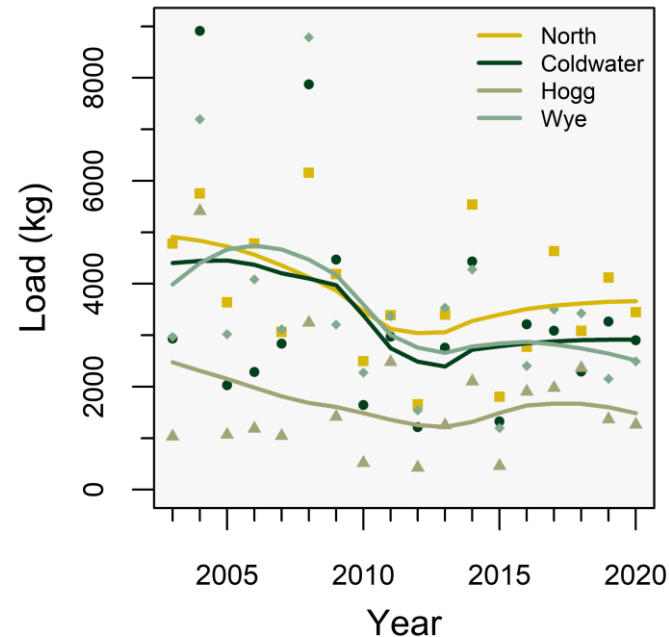
Poor > 30 µg/L

TP Status (2022) = Good

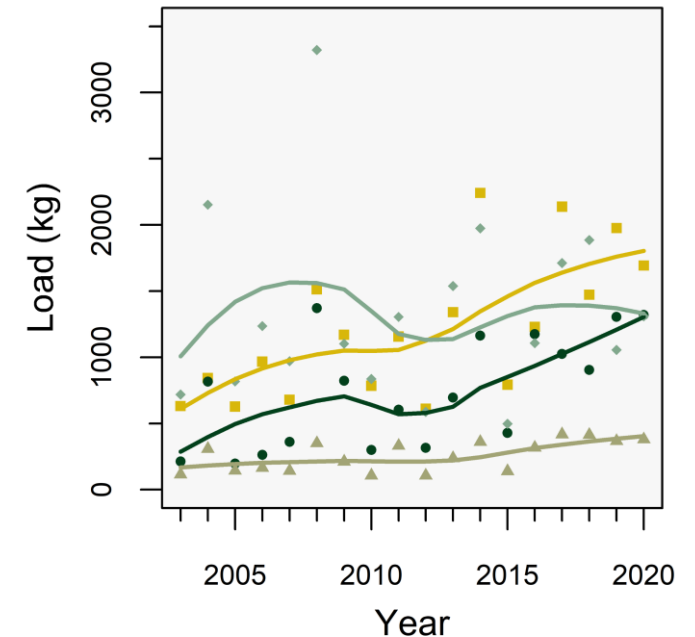
Soluble Reactive P – **Increasing**

Median = 12 µg/L

a) Total P



b) Soluble Reactive P



Long-term change in phosphorus load speciation increasing the risk of eutrophication and undesirable algae

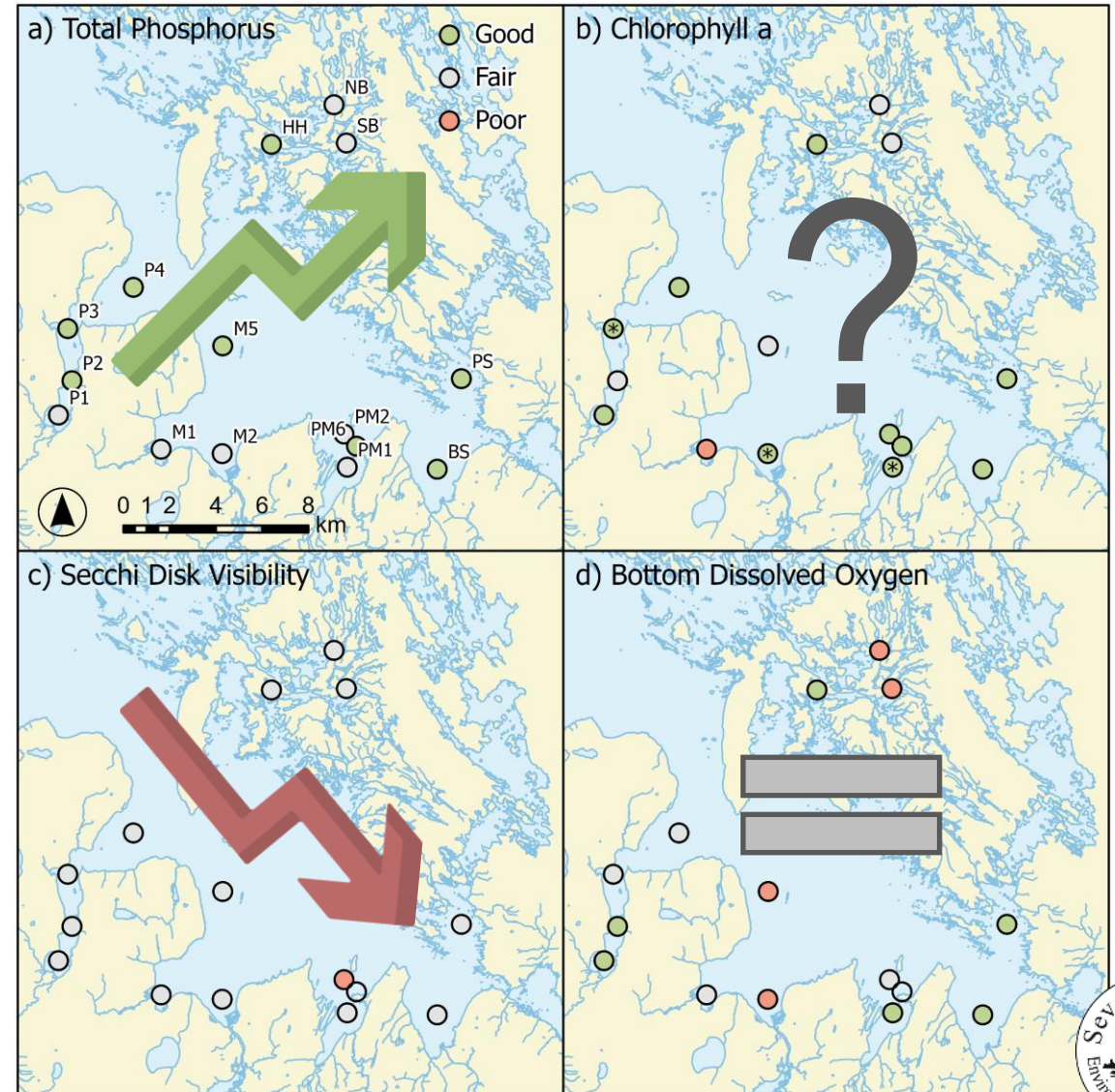
Open Water Quality

Delisting Impairment: Eutrophication or undesirable algae

- TP conc $< 15 \mu\text{g/L}$ in open waters; $< 20 \mu\text{g/L}$ in Penetang Bay
- Chlorophyll *a* conc $< 5 \mu\text{g/L}$ in open waters; $< 7 \mu\text{g/L}$ in Penetang Bay
- Water clarity $> 3 \text{ m}$ (or on bottom) in open waters; $> 2 \text{ m}$ in Penetang Bay
- Bottom DO $> 5 \text{ mg/L}^*$

Status – Fair to good (2022)

Trends – sig. improvement in TP (SRP unknown), deterioration of water clarity



Phytoplankton

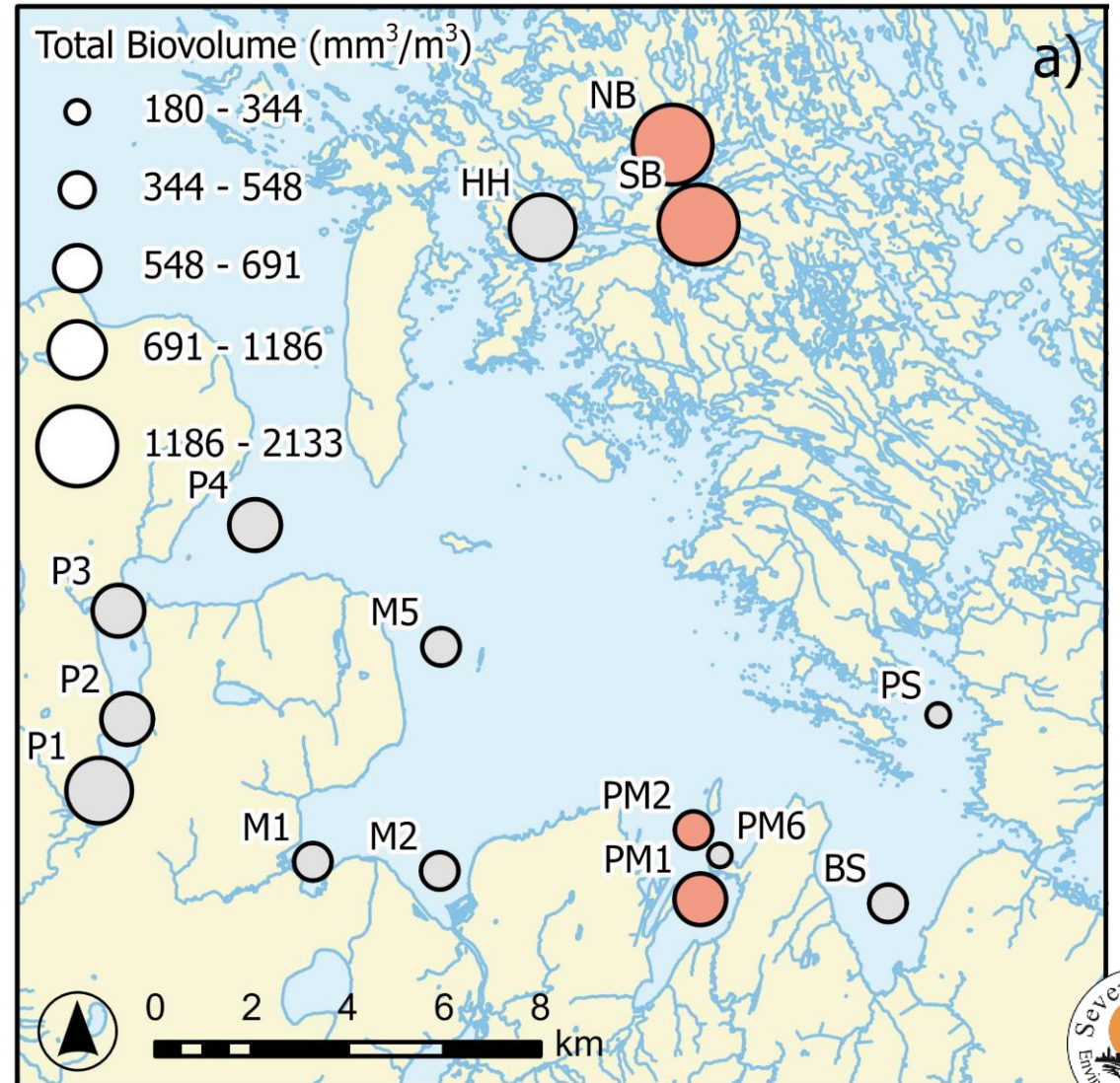
Delisting Impairment: Eutrophication or undesirable algae, degradation of phytoplankton

- Reduction of total phyto biovolume
- Reduction of cyanobacteria biovolume

Algal community reflective of mesotrophic conditions (2016)

Status – total & cyano biovolume low

Trends – green and cyano abundance increasing, diatom decreasing



Zooplankton

Delisting Impairment:

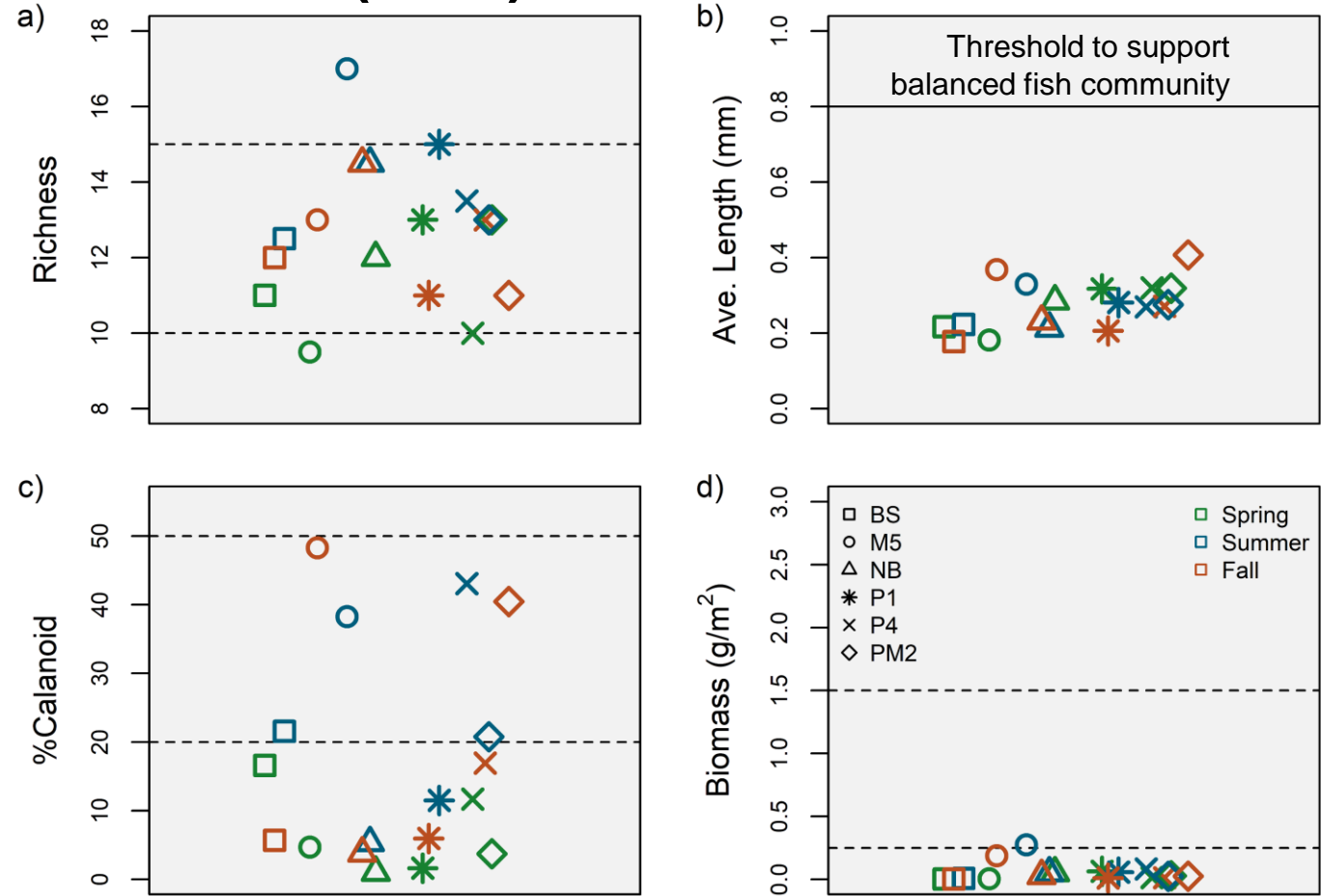
Degradation of phytoplankton & zooplankton

- Zooplankton richness
- Proportion of large-bodied taxa
- Total Biomass
- Ave length to support balanced fish community >0.8 mm

Status - Low biomass, community mostly comprised of small bodied taxa

Trends – Mostly unchanging, contrasting at some sites for different metrics

Status (2022):



Challenges & Opportunities Post-Delisting

How to navigate watershed management after delisting and in the face of political, environmental, social, and economic shifts?

Challenges

- JMSB
- Funding
- Environment response to climate change
- Keeping AOC history top of mind

Opportunities

- JMSB
- Funding
- Non-regulatory but watershed-based
- Cadre of watershed champions



Acknowledgements

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