Welcome

Bruce Peninsula Water Watch
Public Information Meeting
Regarding Proposed Fish Factory

"We acknowledge that we are meeting on the traditional territory of the Chippewas of Nawash. Given our topic tonight, we also thank the Water Walkers, and we thank those who share their traditional teachings around water.
Water is Life, and we hope that fighting to protect the integrity of the waters of Georgian Bay can be an act of reconciliation moving forward."

Land Purchased:

GB Salmon purchased 219 acres at 83 Berford Lake Road, one KM from Colpoy's Bay.

It is located on the UNESCO Biosphere Reserve within the Niagara Escarpment

Image Credit: Google Maps

STOP THE FISH FACTORY!

Image Credit: GB Salmon

The majority of the property is comprised of designated Provincially Significant Wetlands.

Image Credit: Grey Sauble Conservation Authority

STOP THE FISH FACTORY!

Proposed Factory Size:

Will be 11.5 acres

Equivalent to:
39 hockey rinks or
3 Costco warehouses

One of the largest in the world!

Image Credit: GB Salmon

STOP THE FISH FACTORY!

A proposed underground pipeline will take and dump wastewater in a designated 'mixing zone' just outside the water protection zone in Colpoy's Bay.

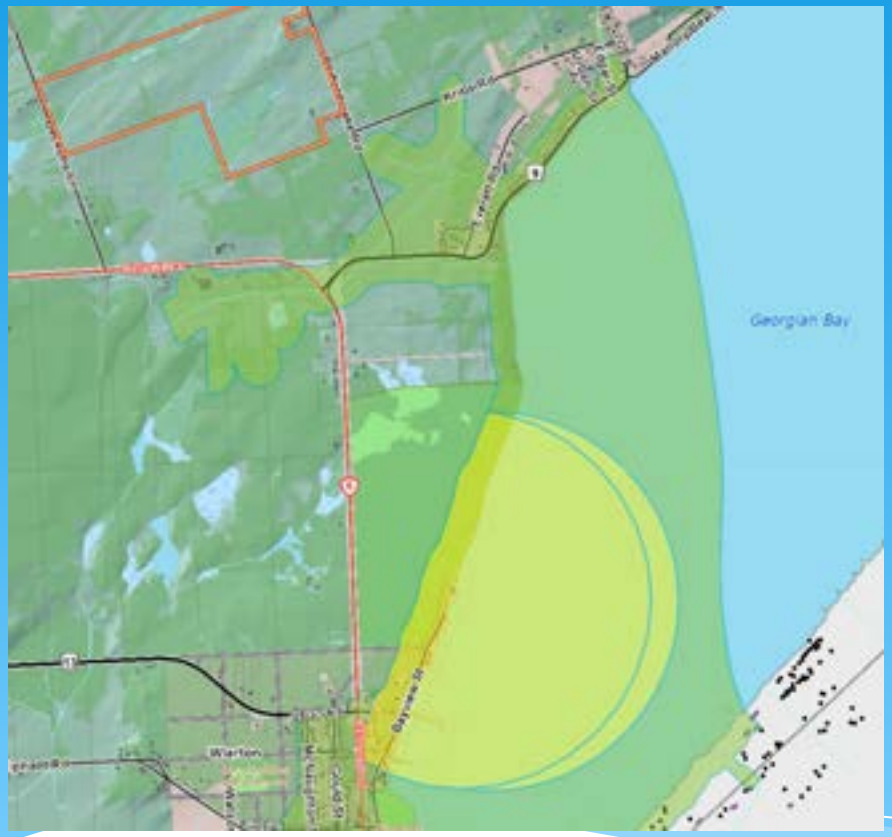


Image Credit: Bruce County Maps

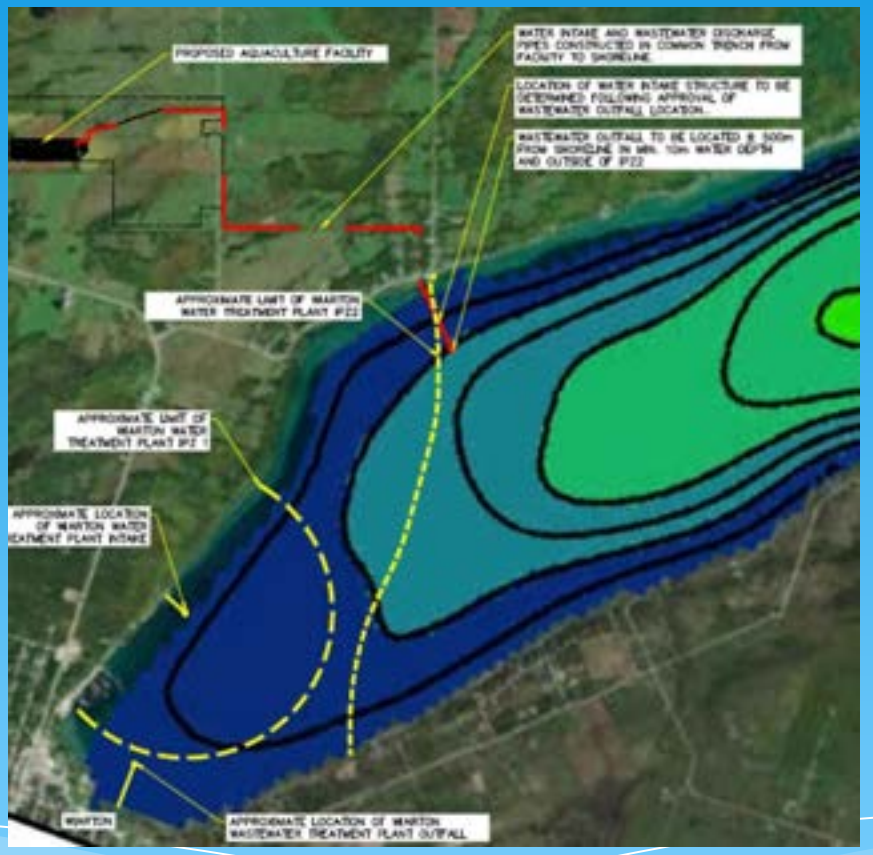


Image Credit: GB Salmon

STOP THE FISH FACTORY!

Water Consumption:
GB Salmon proposes to take:

	DAILY	ANNUALLY
Water Taken	1.8 million litres	680 million litres
Wastewater Returned	1.5 million litres	570 million litres

STOP THE FISH FACTORY!

Production:

GB Salmon plans to produce 15,000 metric tonnes of salmon annually

They will salinate the water required for the salmon, and claim to desalinate before returning to the bay.

Image Credit: GB Salmon

STOP THE FISH FACTORY!

Georgian Bay Salmon
BRINGING THE OCEAN TO YOU

Who is GB Salmon?

GB Salmon, formerly Georgian Bay Innovation Group, claim:

30 years experience?

They will implement an RAS system?

Create 50/200 jobs for the community?

Return no untreated waste to the water source?

Produce up to 15,000 metric tonnes of Atlantic salmon per year?

Truck fish to third party facility for processing?

Willingness to answer questions??

Who is Bruce Peninsula Water Watch?

We are a non-profit citizens' action group concerned about the proposed industrial aquaculture factory planned near Colpoy's Bay.

We came together to help inform, educate and engage not only our local community of the Town of South Bruce Peninsula but surrounding communities of Colpoy's Bay.

Statement from Saugeen Ojibway Nation

The Saugeen Ojibway Nation represents Saugeen First Nation and Chippewas of Nawash Unceded First Nation. The SON People hold a special relationship with the Water, and with all beings that inhabit the Water. This relationship is based on cultural ways of knowing, understanding, and living in this world in a good way; this relationship has existed since the beginning, since time beyond memory. SON relates with Water as that which brings and sustains life, both to the People and to all of Creation. It is this sacred relationship that makes it imperative that SON uphold their duty to care for and protect the Water. SON also holds Aboriginal and Treaty rights throughout SON Territory, as well as commercial fishing rights which are protected by the *R v. Jones and Nadjiwon* decision. Because SON is a rightsholder, SON engages in a consultation process that is different from public stakeholders.

Through its Environment Office, the Saugeen Ojibway Nation is in the early days of consultation with Georgian Bay Salmon on the proposed project. Currently, we are waiting on additional information from assessments being conducted by the proponent's consultants and also doing our own assessments to help inform continued consultation. At this point, there is not yet enough information available to fully understand and assess the potential impacts of this proposed project on SON's rights, responsibilities, and interests.

Environment Office
Saugeen Ojibway Nation.

Welcome

Brad Kewenzie

Elder

Artist

Pipe Carrier

Knowledge Keeper

Land and Water Defender of this area from Neyaashiinigmiing

Thank-you

Dr. Patricia Chow-Fraser

Professor, Department of Biology
McMaster University

& Graduate Students

Potential Impacts of Georgian Bay Salmon's Proposed Aquaculture Facility in Wiarton, ON

McMaster University

SCIENCE

Department of Biology

Biology 730

Management of Aquatic Ecosystems and Resources

Image credits: SON Environment Office

Reta Meng
MSc candidate in Biology
Chow-Fraser Lab

Brynn Hickey
MSc candidate in Biology
Chow-Fraser Lab

Jacqui Vinden
MSc candidate in Biology
Chow-Fraser Lab

Sally Ju
MSc candidate in Biology
Kidd Lab

Elaine Marzec
MSc candidate in Biology
Chow-Fraser Lab

In this final presentation for our course, we will discuss the **socioeconomic, biological, and ecological** implications of the proposed Georgian Bay Salmon aquaculture project

Maddie McCaig
MSc candidate in Biology
Kidd Lab

Jonah Lehman
MSc candidate in Biology
Chow-Fraser Lab

Jenni Velichka
MSc candidate in Biology
Kidd Lab

John Fast
MSc candidate in Biology
Kidd Lab

Sina Zarini
PhD candidate in Behavioural Ecology
Balshine Lab

About This Presentation

Objectives:

- Witness statement for us to share what we've learned with the community
- Discussion on important factors that need to be addressed
- Applications lacking explanation should not be accepted
- No comparison between types of aquaculture production
- Will not discuss optimal use of land within the proposed site
- Not assessing the most sustainable way to feed the world

Link to the Final Presentation is on the Smellsfishy.org Latest News

Ecological Information Checklist

Solid Waste

Sludge Treatment/Thickening

- ❑ Methods & protocol for sludge treatment & storage

Sludge Disposal & Recycling

- ❑ Use as fertilizer & methods for testing salinity & contaminants
- ❑ Plan for sludge transportation & disposal, costs & GHG emissions
- ❑ Sustainability assessment of waste management at current proposed scale

Disposal of dead fish

- ❑ Protocol for transportation & disposal of dead fish
- ❑ Viability of transportation to nearest facility & GHG emissions

Liquid Waste

- ❑ Size and location of mixing zone
- ❑ Enforceable effluent water quality parameters
- ❑ Salinity removal plans
- ❑ Mixing zone model needs to be peer reviewed and open to the public

Biosecurity

- ❑ Plans for antibiotic administration
- ❑ Egg and feed source
- ❑ Control of bacteria and viruses
- ❑ Plans for potential usage of biocides, antibiotics

Socioeconomic Information Checklist

Product Quality

- ❑ Which feed will GBS use to limit contaminants and optimize nutrients in their fillet?

Jobs

- ❑ Out of the 200 jobs, how many of those will be indirectly and/or directly to the aquaculture facility?
- ❑ Will the indirect and direct jobs be able to sustain/attract a growing population?
- ❑ Will any jobs be directly for the Saugeen-Ojibway?

Water Quality

- q Will the water quality in Colpoy's Bay be reduced?

Culture and Values

- q Smells, noises, and lights from facility?
- q Potential entrapment of aquatic species within intake pipe?
- q Detraction of tourist to area due to artificial facility?

Energy

- q How GBS plans to minimize energy use
- q Government subsidy availability to lower energy costs

Transportation

- q Location and distance to processing facility
- q Number of trucks and when they will operate (i.e., during day or night)

Saugeen-Ojibway Nation

- q Respect the rights and interests of the SON
- q Will GBS facilitate discussions on potential mutual benefits?

Welcome

Dr. Barry Zajdlik

Principal, Zajdlik and Associates

Potential Adverse Effects of the Proposed GB Salmon Farm

Dr. B. Zajdlik, Zajdlik & Associates Inc.

Propellor Club, Wiarton ON,

June 3rd 2022

Purpose

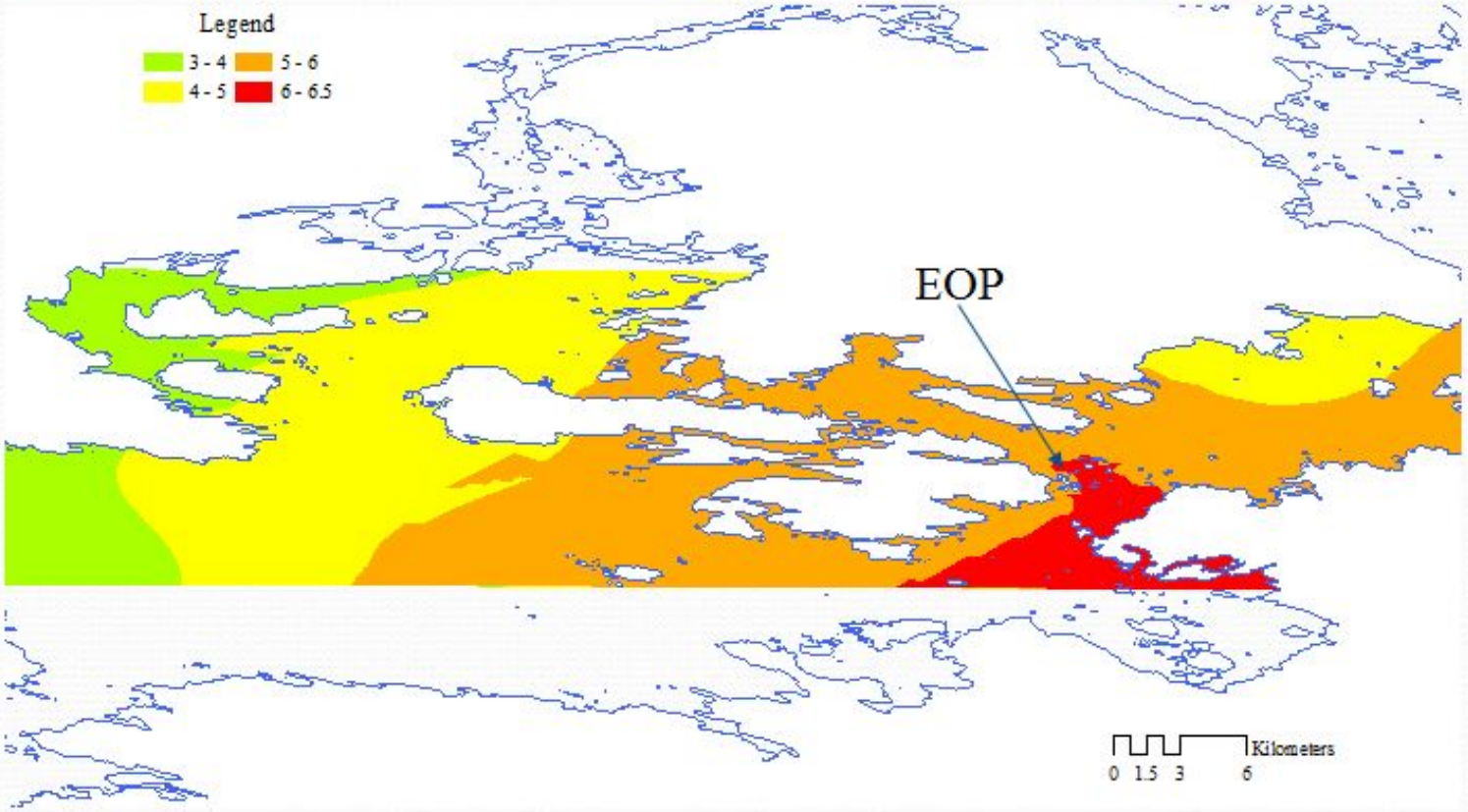
- My goal is to help concerned citizens understand:
  - How effluent discharge is managed in Ontario.
  - Potential adverse effects of this Project.

End of Pipe

- Our discussion begins here.
  - Last point of control.
  - Federal requirement for no acute toxicity.

End of Pipe

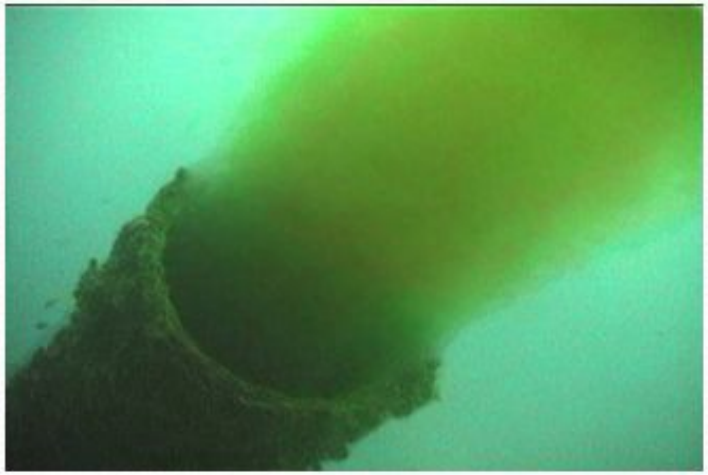
- Effluent Plume
  - Varies with temperature and density.
  - Currently not known.
  - Plume delineation study typically required.
  - Critical input for modelling potential effects.



- Nutrient study
  - Shows how phosphorus concentrations change.

Mixing Zone

1. Chronic effects are allowed to occur.
2. Should be as small as possible.
3. Federal guidance on mixing zones.



Mixing Zone

- Key variables for water quality modelling
  - Location
  - Depth
  - Velocity
  - Temperature
  - Density
  - Will diffusers be used?
  - Volume of discharge
  - Concentration of discharge

Edge of Mixing Zone

- Conditions can be required.
  - For example, the absence of chronic toxicity.
- Have to meet water quality guidelines at edge of mixing zone.

Beyond Mixing Zone

- Conditions can be required.
  - For example, the absence of shifts in plankton composition and ecology.

Summary

- Three possible areas for compliance requirements:
  - End of pipe
    - Federal Requirement for acute lethality
    - Negotiate loading limits – possibly for nitrogen species and phosphorus
  - Edge of mixing zone
    - Water Quality Guidelines
    - Negotiate chronic toxicity
  - Outside mixing zone
    - Negotiate changes to ecosystem

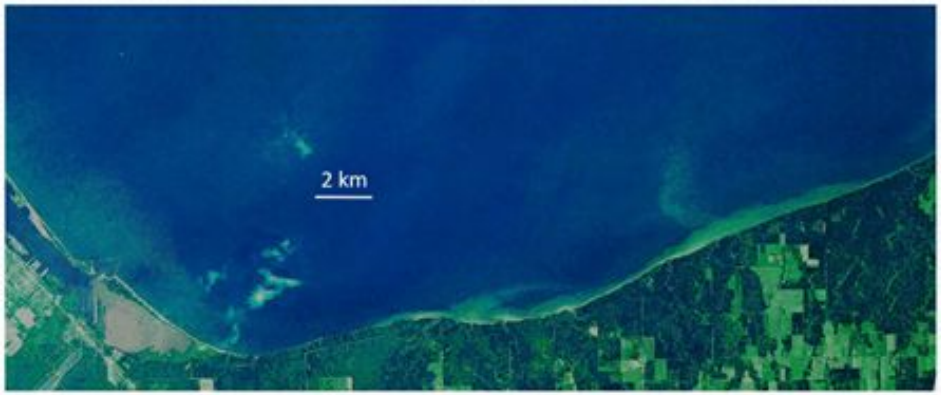
Effluent Composition and Potential Effects

- Constituents
  - Antibiotics used to treat bacterial infections.
  - Medications used to treat parasites.
  - Nutrients such as forms of nitrogen and phosphorus.
  - Trace elements.

- Water Quality Variables
  - pH, conductivity and alkalinity at least will likely be different than the water of Colpoys Bay.

Nutrient Enrichment – Algal Blooms

1. Algal blooms
   - Aesthetics – smell and taste
   - Safety

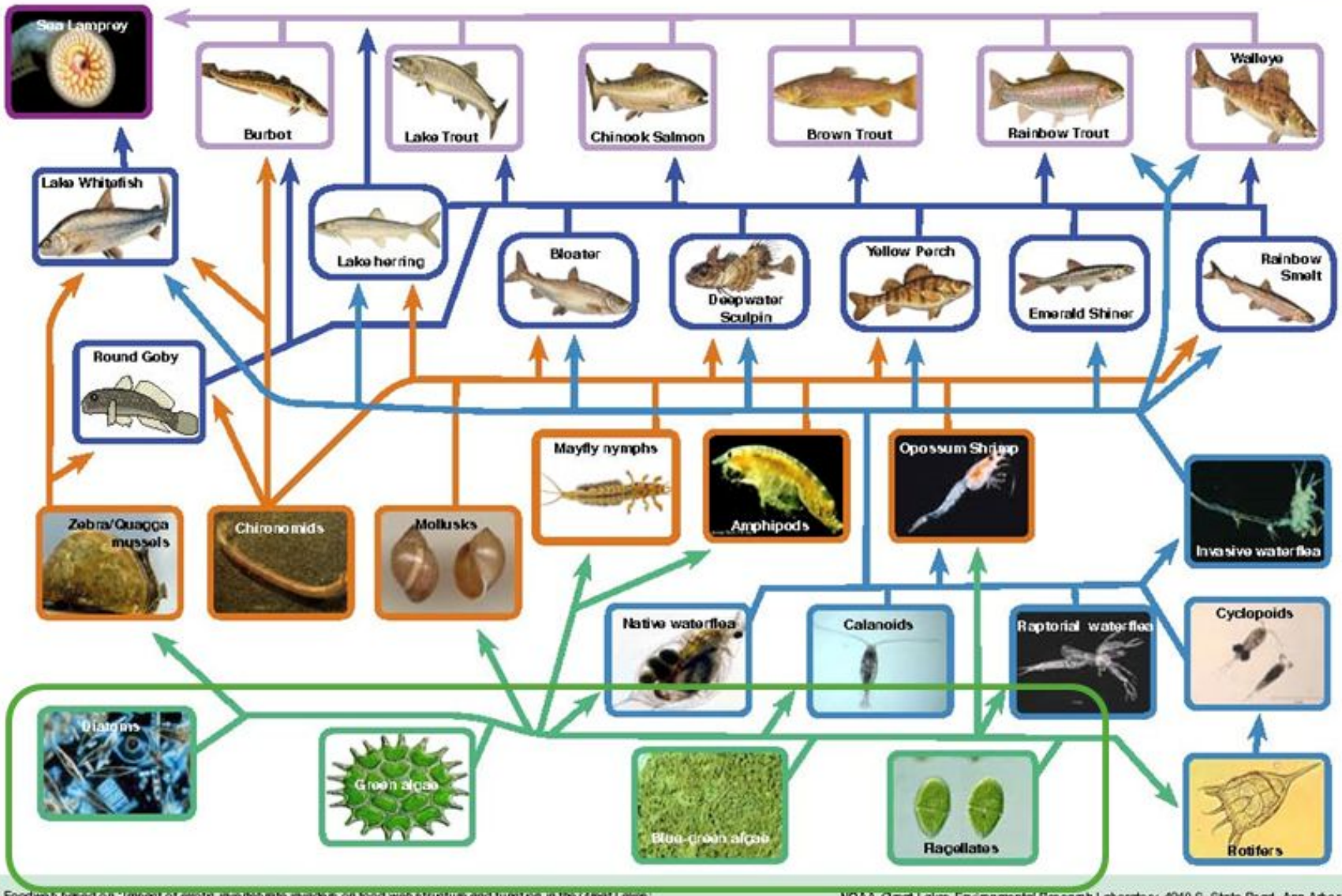


- "The aesthetic / recreational value of the water may decrease."

- Lake Superior
  - stormwater runoff
  - first demonstrated cyanobacterial bloom 2012-2018

Canadian Guidance Framework for the Management of Phosphorus in Freshwater Systems

Lake Huron Food Web

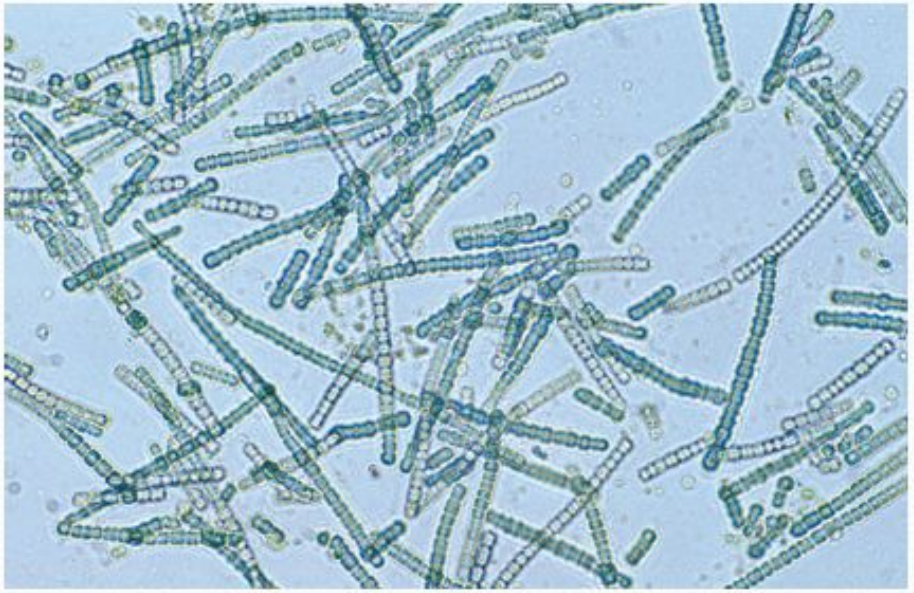


Foodweb based on "Impact of exotic invertebrate invaders on food web structure and function in the Great Lakes: A networkanalysis approach" by Mason, Krause, and Ulanowicz, 2002 - Modifications for Lake Huron, 2009.

NOAA, Great Lakes Environmental Research Laboratory, 4840 S. State Road, Ann Arbor, MI
734-741-2235 - www.glerl.noaa.gov

Nutrient Enrichment – Algal Blooms

- Algae are microscopic plants.
- Cyanobacteria are one type of algae.
- Cyanobacteria produce cyanotoxins.



Cylindrospermum sp.

Health Effects

Health Canada drinking water
MAC = 0.0015 mg/L
US EPA (2019) has recreational water quality criteria

Cyanotoxins	Acute Health Effects in Humans	Most Common Cyanobacteria Producing Toxin
Microcystin-LR	Abdominal pain, headache, sore throat, vomiting and nausea, dry cough, diarrhea, blistering around the mouth, and pneumonia	*Microcystis*, *Dolichospermum (previously Anabaena)*, *Nodularia*, *Planktothrix*, *Fischerella*, *Nostoc*, *Oscillatoria*, and *Gloeotrichia*
Cylindrospermopsin	Fever, headache, vomiting, bloody diarrhea	*Raphidiopsis (previously Cylindrospermopsis) raciborskii*, *Aphanizomenon flos-aquae*, *Aphanizomenon gracile*, *Aphanizomenon ovalisporum*, *Umezakia natans*, *Dolichospermum bergii*, *Dolichospermum lapponica*, *Dolichospermum planctonica*, *Lyngbya wollei*, *Rhaphidiopsis curvata*, and *Rhaphidiopsis mediterranea*
Anatoxin-a group	Tingling, burning, numbness, drowsiness, incoherent speech, salivation, respiratory paralysis leading to death (experimental animals)	*Chrysosporum (Aphanizomenon) ovalisporum*, *Cuspidothrix*, *Raphidiopsis*, *Cylindrospermum*, *Dolichospermum*, *Microcystis*, *Oscillatoria*, *Planktothrix*, *Phormidium*, *Dolichospermum flos-aquae*, *A. lemmermannii* *Raphidiopsis mediterranea* (strain of *Raphidiopsis raciborskii*), *Tychonema* and *Woronichinia*

https://www.epa.gov/cyanohabs/health-effects-cyanotoxins

Nutrient Enrichment – Algal Blooms

- Example of a water licence condition for cyanobacteria.

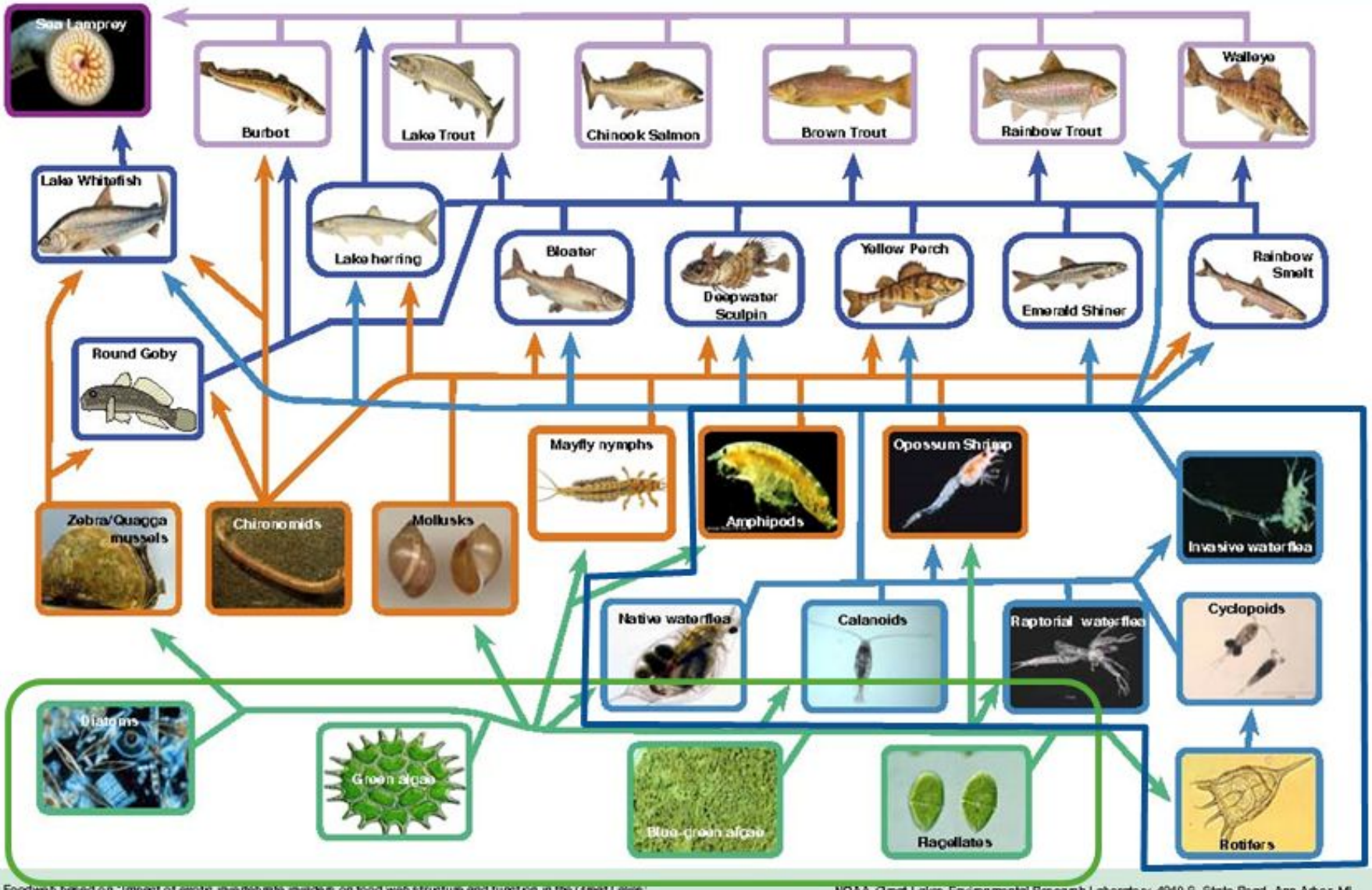
A visual algal bloom or a shift in phytoplankton community composition to cyanobacteria dominance measured as ≥80% proportion of cyanobacteria in the community in Snap Lake and detectable microcystin concentrations at two or more stations in Snap Lake.

Snap Lake Closure Plan 2020

Nutrient Enrichment – Community Composition

- The numbers of individuals from one species shifts.
- Some species are not as desirable a food source as others.

Lake Huron Food Web



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Nutrient Enrichment – Community Composition

- Example of a water licence condition for plankton community composition

A shift in phytoplankton community composition from chrysophytes and diatoms to cyanobacteria and chlorophytes measured as a ≥50% reduction in baseline proportions of chrysophytes and diatoms in Snap Lake.

Snap Lake Closure Plan 2020

Nutrient Enrichment – Bases for Comparison (1)

- The previous two examples of water licence conditions mention comparison to baseline data.
- Baseline data are collected before discharge begins.

Nutrient Enrichment – Bases for Comparison (2)

- Baseline data requirements
  - Minimum of 3 years
  - Coverage over all seasons – open water, fall turn over, under ice and spring turnover
  - Requires "adequate" coverage near discharge site and additional coverage outside dilution zone.

Summary

- Possible effects
  - Phytoplankton blooms – smell, taste, safety
  - Changes in plankton – affects food web
  - Others- antibiotics, medications, trace elements

- Solutions
  - Require conditions in Environmental Compliance Approval.

Assimilative Capacity

- GB Salmon
- Wiarton WWTP
- Storm drain overflows
- Non-point sources

Wiarton WWTP Discharge Volumes

- The total wastewater treatment plant effluent flow in 2020 was 556,314 m^3 with an annual average daily flow of 1,520 m^3/day.
- GB Salmon proposes to discharge 1,500[1] m^3/day.

- This would double the point-source effluent volumes to Colpoys Bay.

- Of interest are loads of chemicals to Colpoys Bay.

1 https://www.smellsfishy.org/

Wiarton WWTP Effluent Limits

Effluent Parameter	Average Concentration (milligrams per litre unless otherwise indicated)	Average Waste Loading (kilograms per day unless otherwise indicated)
Total Suspended Solid	15.0	66
Total Phosphorus	0.3	1.32
Total Ammonia Nitrogen(TAN) May 1 to October 31	3.0	13.2
Total Ammonia Nitrogen(TAN) November 1 to April 30	6.0	26.4

MOECP. 2017. Amended Environmental Compliance Approval, NUMBER 6211-AGEU4W, 2017

Where to From Here? (1)

- Be ready to review Proponent's submission to MOECP.

- Goal
  - To understand the limits of the water quality model and conclusions reached.
  - Ensure that all potential effects are considered.
  - Ensure that the correct level of diligence is required of the Proponent.

Where to From Here? (2)

- Will include:
  - Adequacy of baseline data for decision making.
    - Spatial and temporal coverage.
    - Correct measurement endpoints – water quality, phytoplankton, zooplankton at a minimum.

Where to From Here? (3)

- Will include:
  - Assessment of model inputs
    - Effluent composition, volume, depth, and temperature as affected by seasonal variation
    - Colpoys Bay water quality as affected by seasonal variation
    - Spatial domain

Where to From Here? (4)

- Will include:
  - Assessment of permit conditions
    - Measurable and actionable changes in water quality phytoplankton composition, zooplankton composition.
    - Loadings limits for nutrients.

Where to From Here? (5)

- Will include:
  - Variability in model inputs and effects on conclusions.
  - Degrees of conservatism.
  - Monte Carlo analyses.

Thank you for your attention.

Welcome

Ron Gatis

Local life-long resident
3 generations of family history