

Investigating Concerns of Aquaculture Impacts at Bayswater Beach

Aquaculture Science Advisory Committee

NSDFA – JESSICA FEINDEL

OCTOBER 29, 2021

Agenda



Complainant Concerns



Responses to Concerns



Data Analysis & Results



Conclusions & Next Steps

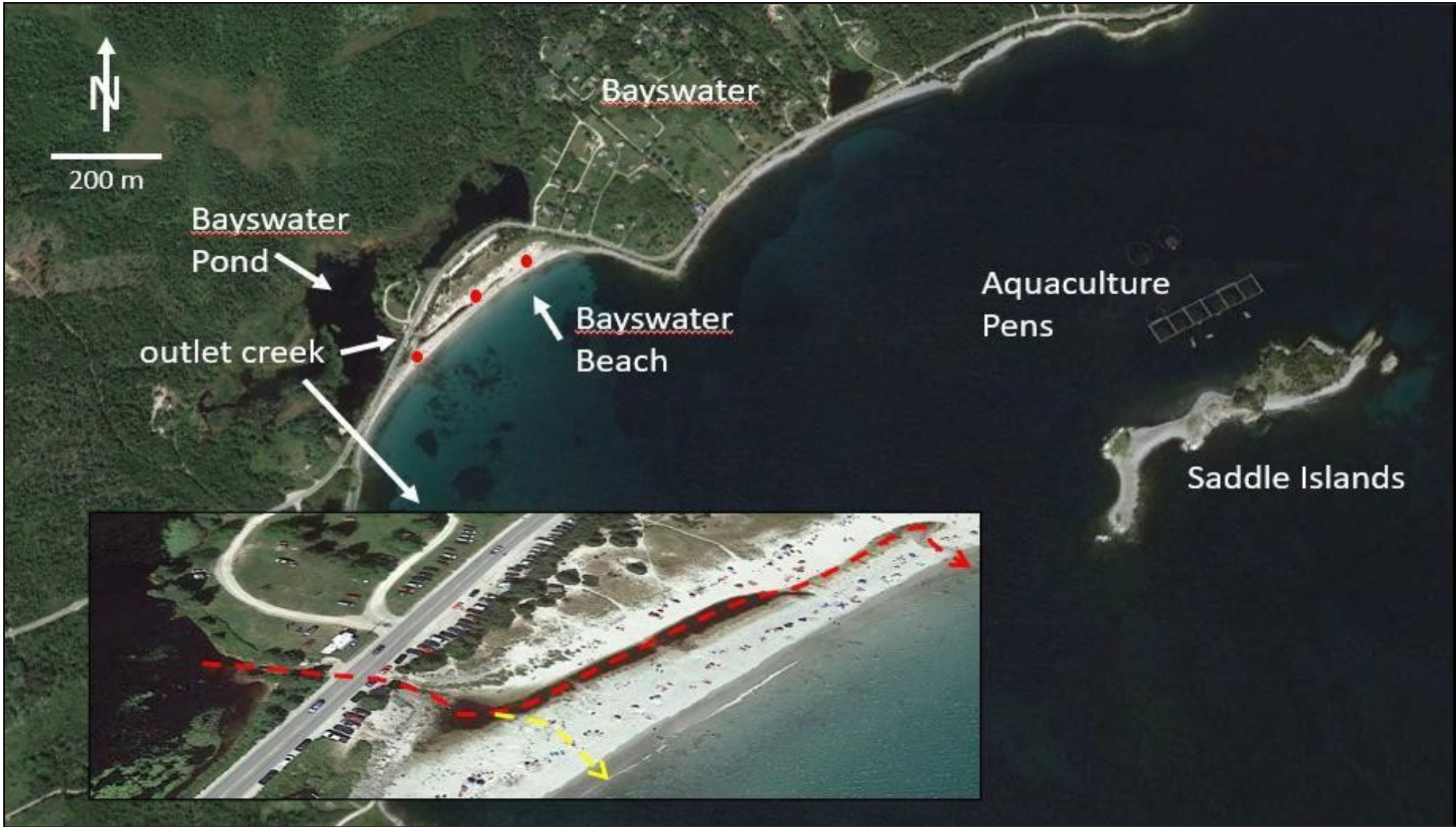


Public Response to Study

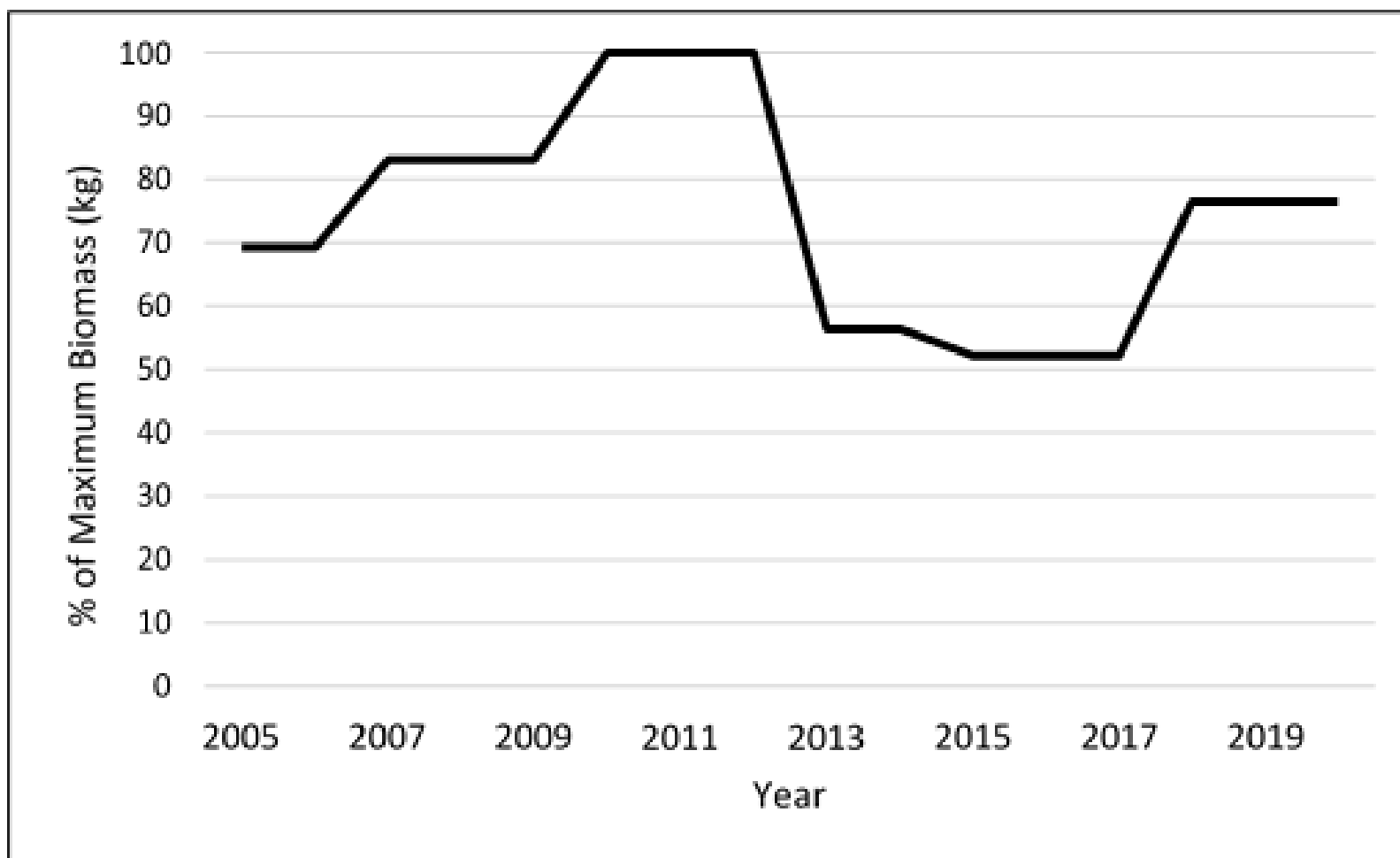
Complainant Concerns

Complainant concerns

- ▶ Black sediment on Bayswater Beach
- ▶ Sulfur odour coming from impacted beach areas
- ▶ Repeated beach closures due to water quality
- ▶ 2018 site expansion



2018 Site Expansion



Beach Closures due to Water Quality

- ▶ Water quality at Bayswater Beach is typically sampled weekly from July 1st to September 1st.
- ▶ Periodic closures of the beach due to high bacteria levels (E.coli & enterococci sp)
- ▶ **The bacteria of concern are from warm-blooded animals and are not coming from fish**



Responses to Concerns

Beach Visits

- ▶ NS Dept Environment & Climate Change conducted **a minimum of three beach visits** following complaints: two visits by an Environment Inspector and one by a Conservation Officer.
- ▶ **An additional beach visit was** conducted by NS Dept Lands and Forestry
- ▶ ADDED: NS Lifeguard presence
- ▶ During these visits, no evidence was found directly associating the condition of the beach with the operation of aquaculture site AQ#1006.
- ▶ Following these inspections, the complainant continued to express concern regarding the condition of the beach through emails and phone calls to various departments
- ▶ In November 2020 Dr. Spooner conducted an **exploratory visit** to Bayswater Beach to assess its morphology

Working Group Establishment

Intent

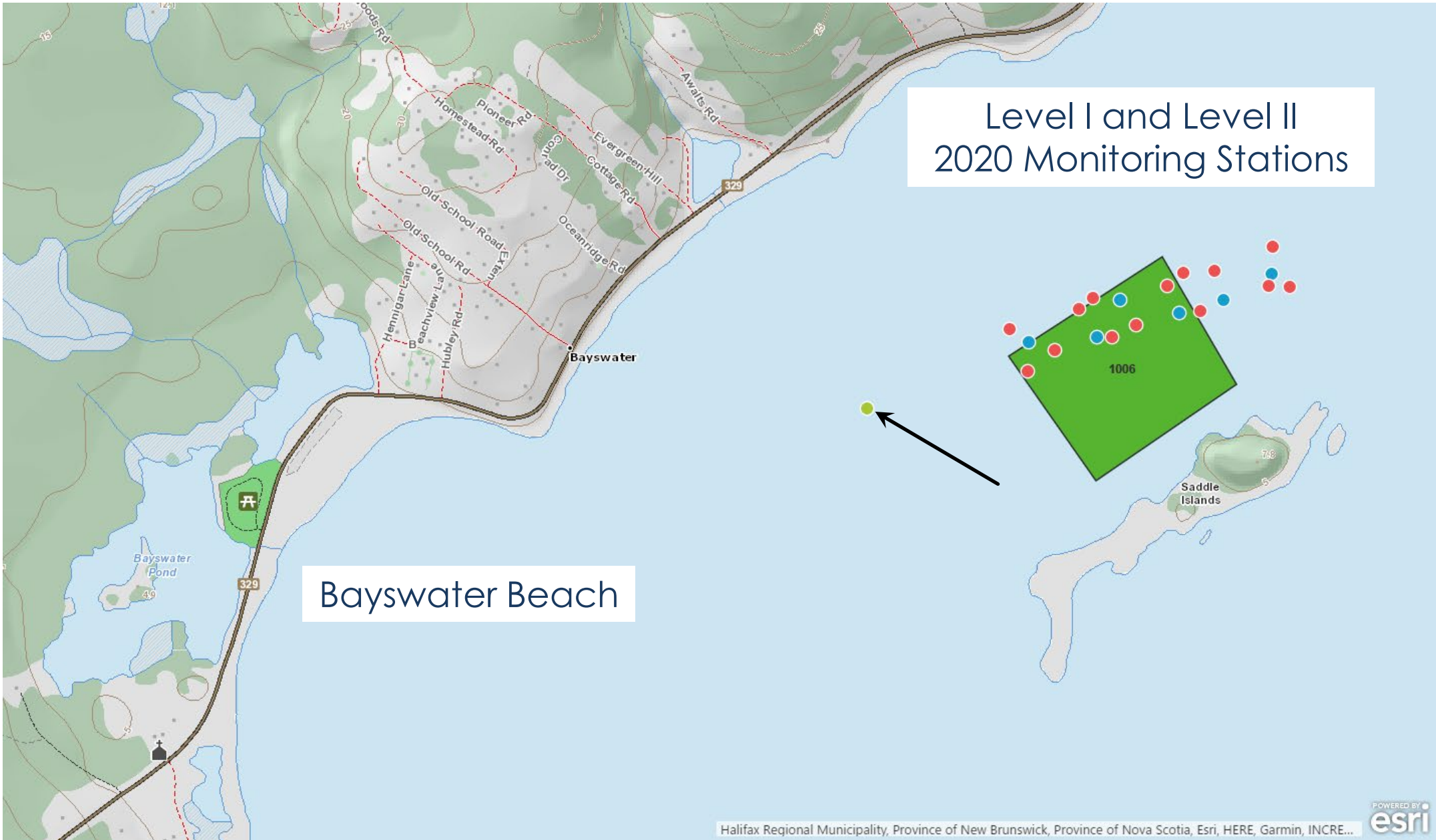
1. Mutual understanding of the complainant concerns and ensure consistent communication
2. Collaborate on an approach to investigate origin of decaying organics to infer if there was a link to the aquaculture operation

Participants:

- NS Dept Fisheries and Aquaculture
- NS Dept Environment & Climate Change
- NS Dept Lands and Forestry
- Dept Fisheries and Oceans – Aquaculture Management & Aquaculture Science
- Centre for Marine Applied Research
- Acadia University

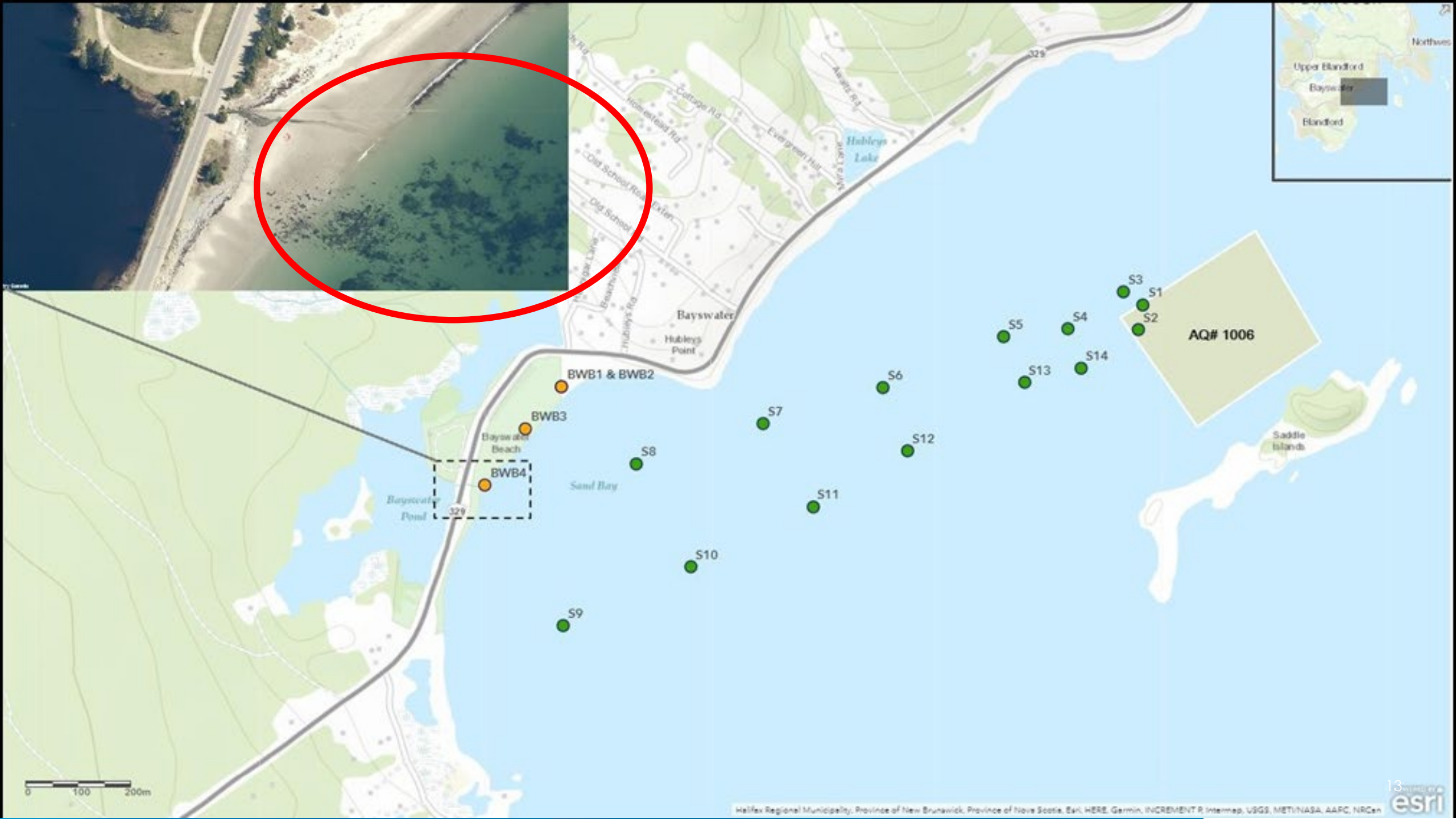
Level I and Level II 2020 Monitoring Stations

Bayswater Beach



Halifax Regional Municipality, Province of New Brunswick, Province of Nova Scotia, Esri, HERE, Garmin, INCRE...

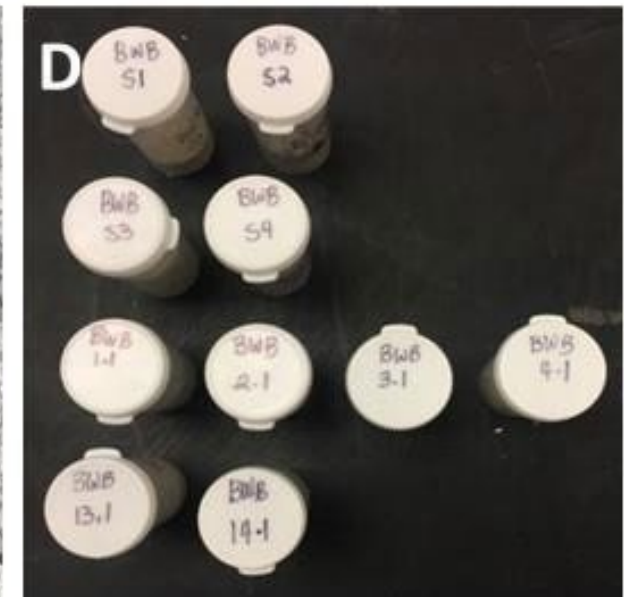
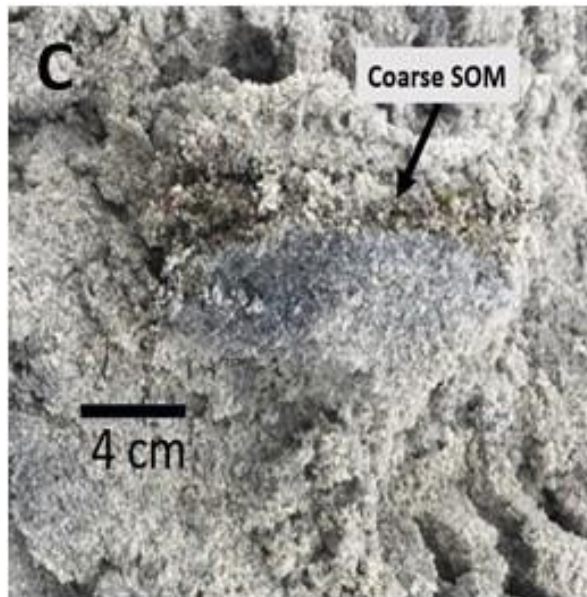
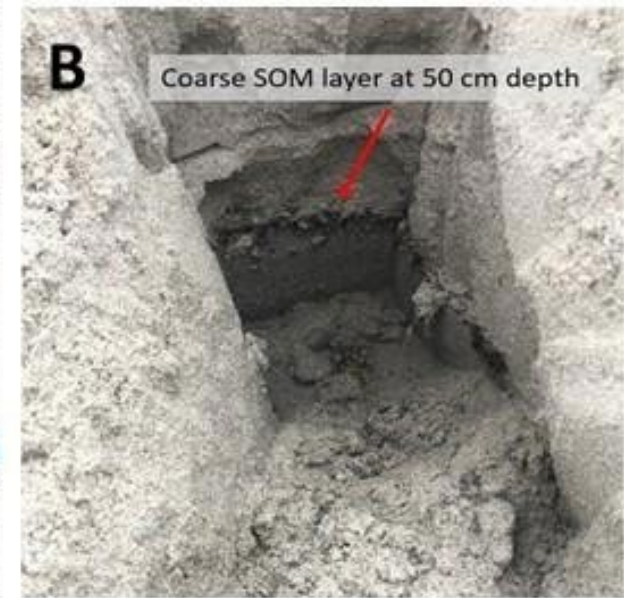






Beach Sampling

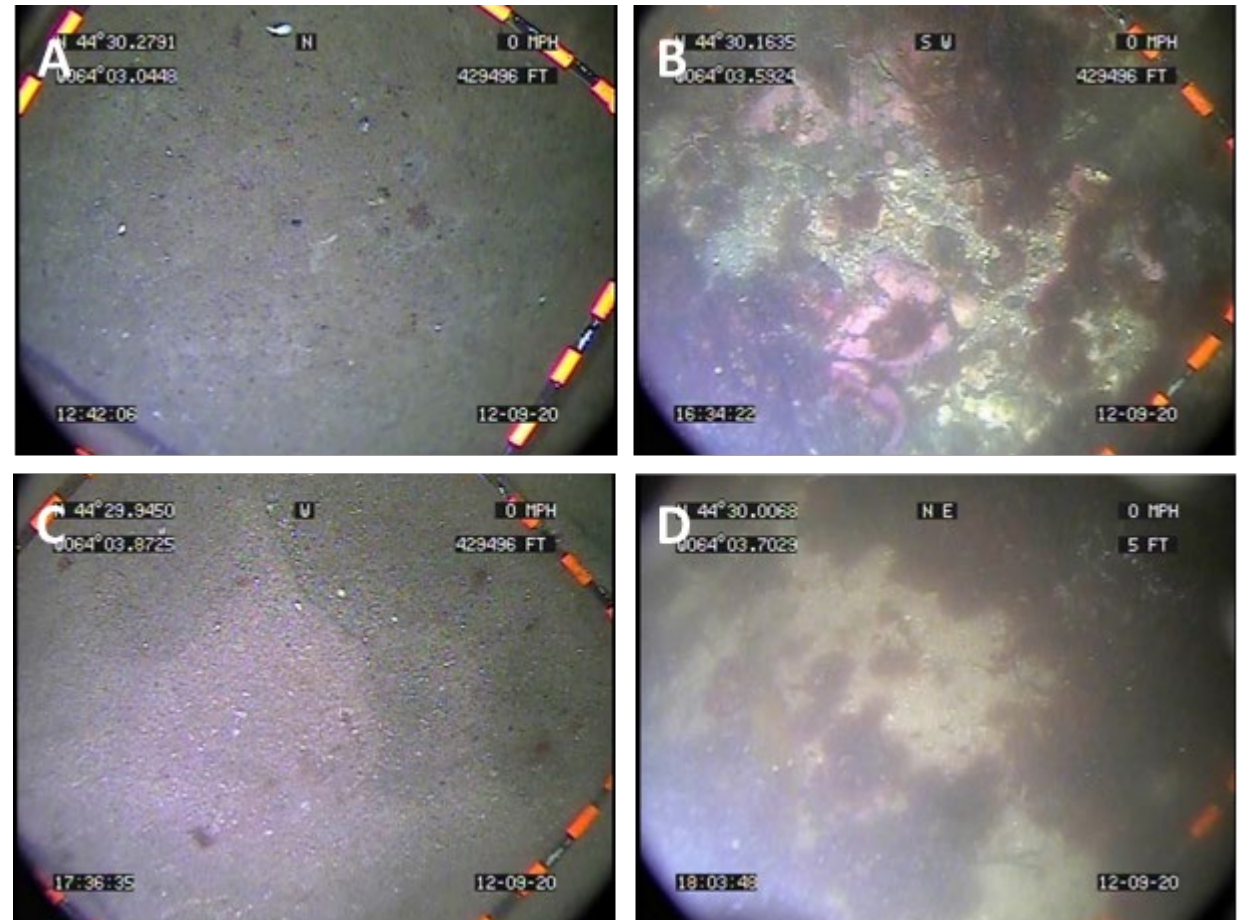
- ▶ Sampling conducted by Dr. Ian Spooner on January 16th, 2021
- ▶ Sediment samples collected from 4 test pits
- ▶ Isotope analysis



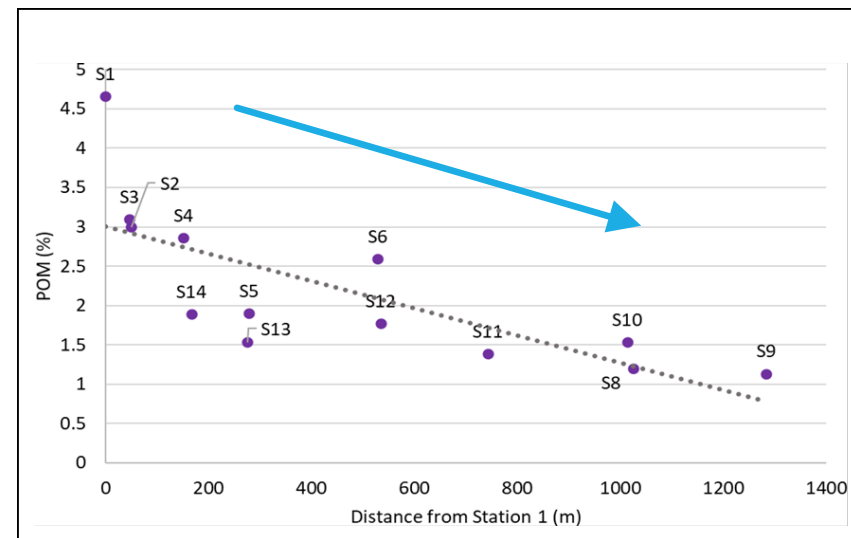
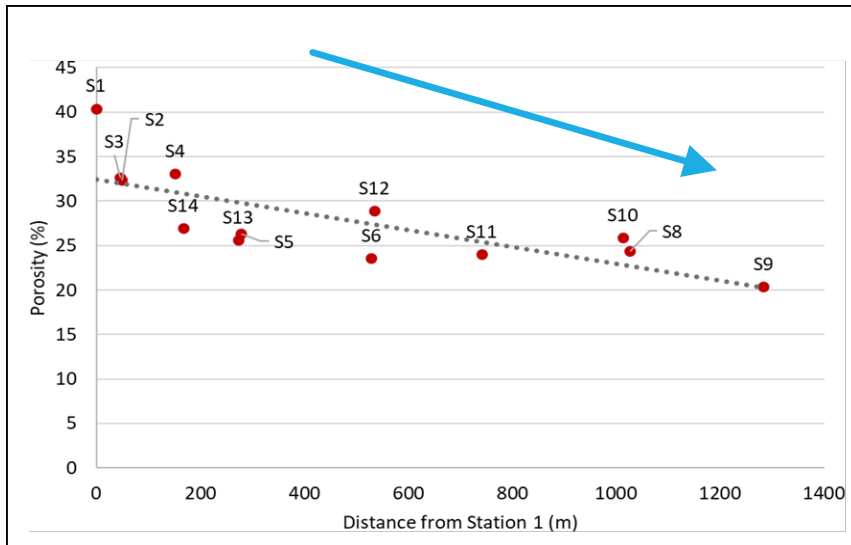
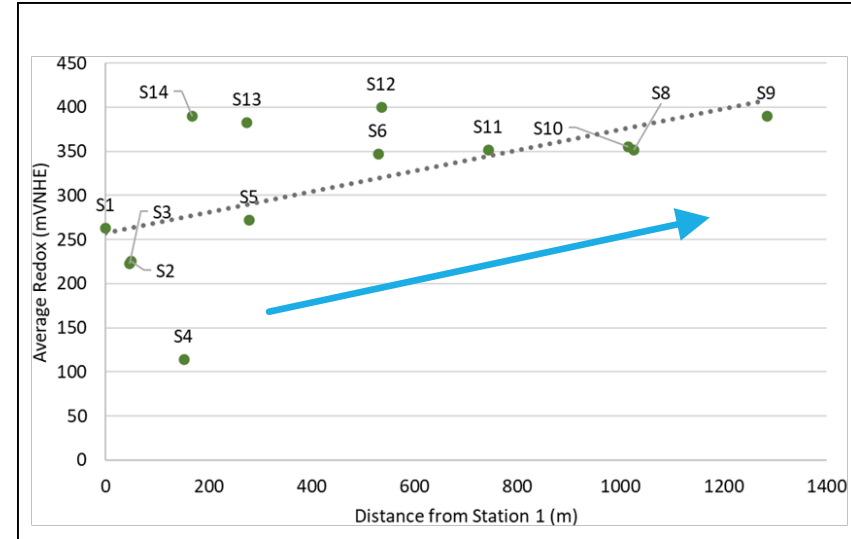
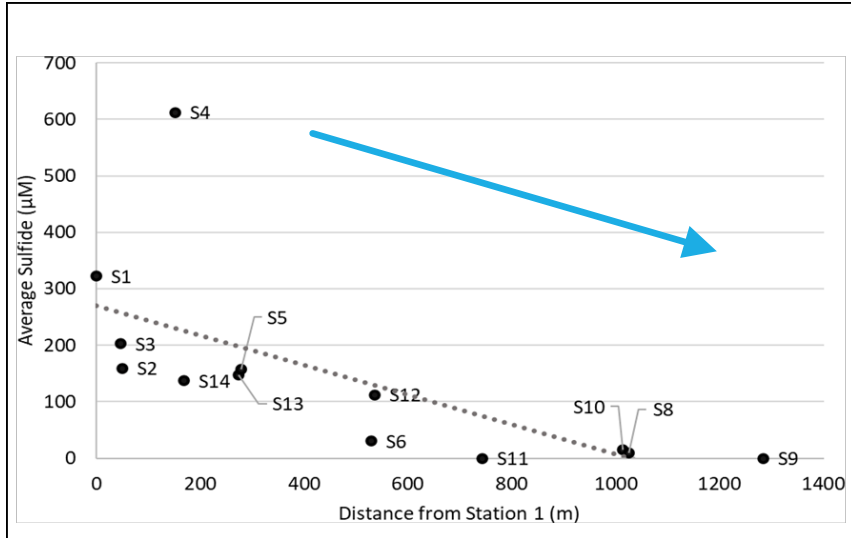
Data Analysis

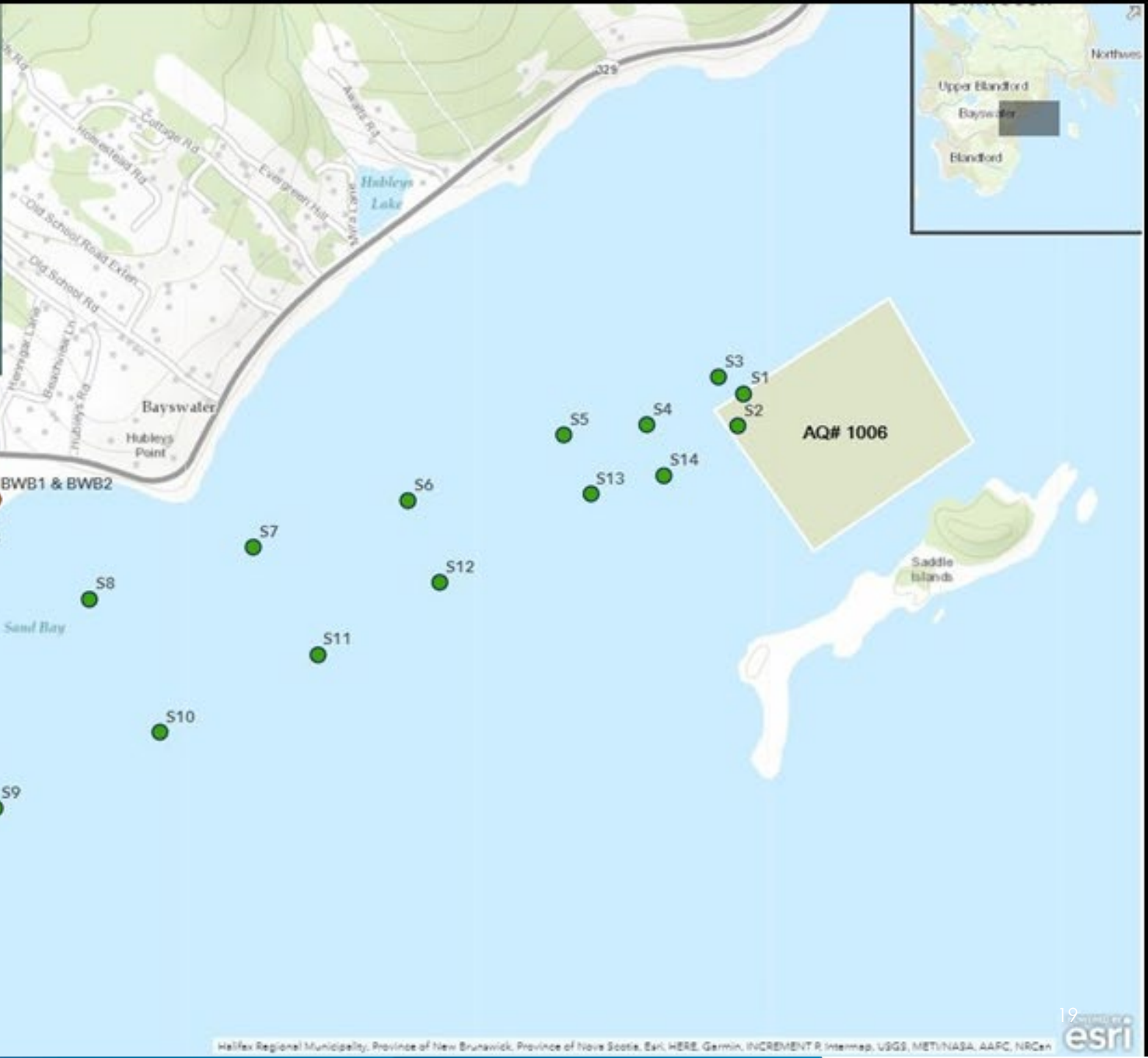
Visual Assessment

- ▶ A variety of sediment conditions were observed along the length of the transects
- ▶ Fine sand and silt near the lease (A)
- ▶ Rocky, seaweed covered benthos near the Hubley's point outcropping (B)
- ▶ Coarse sand nearest to the beach (C, D)

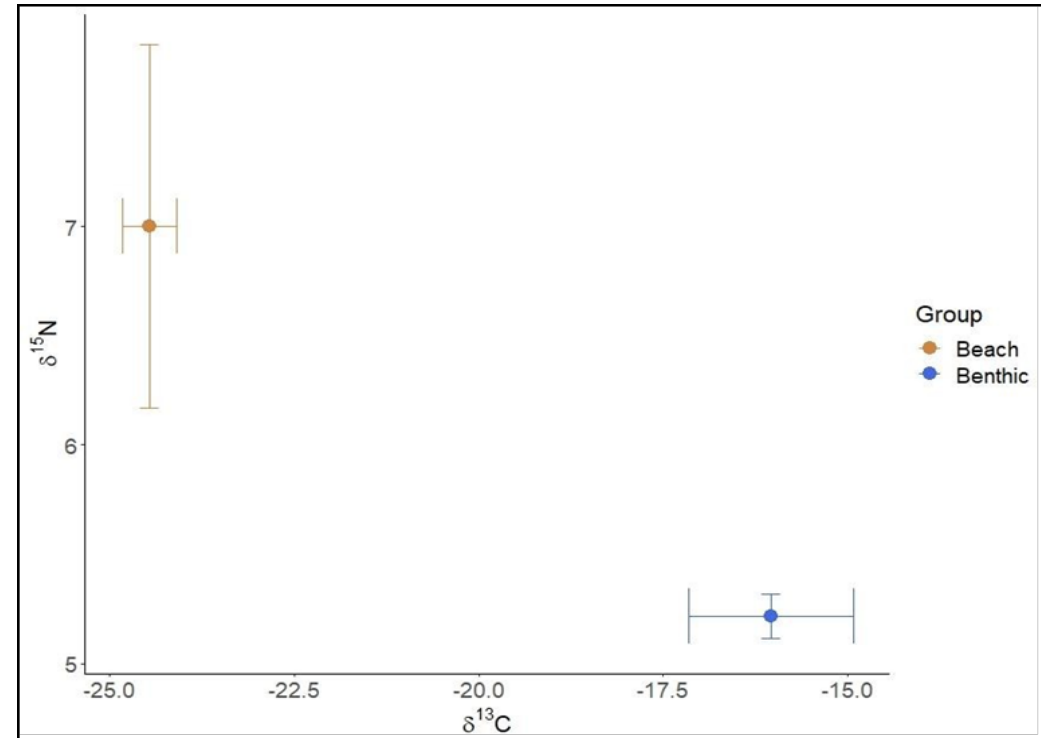
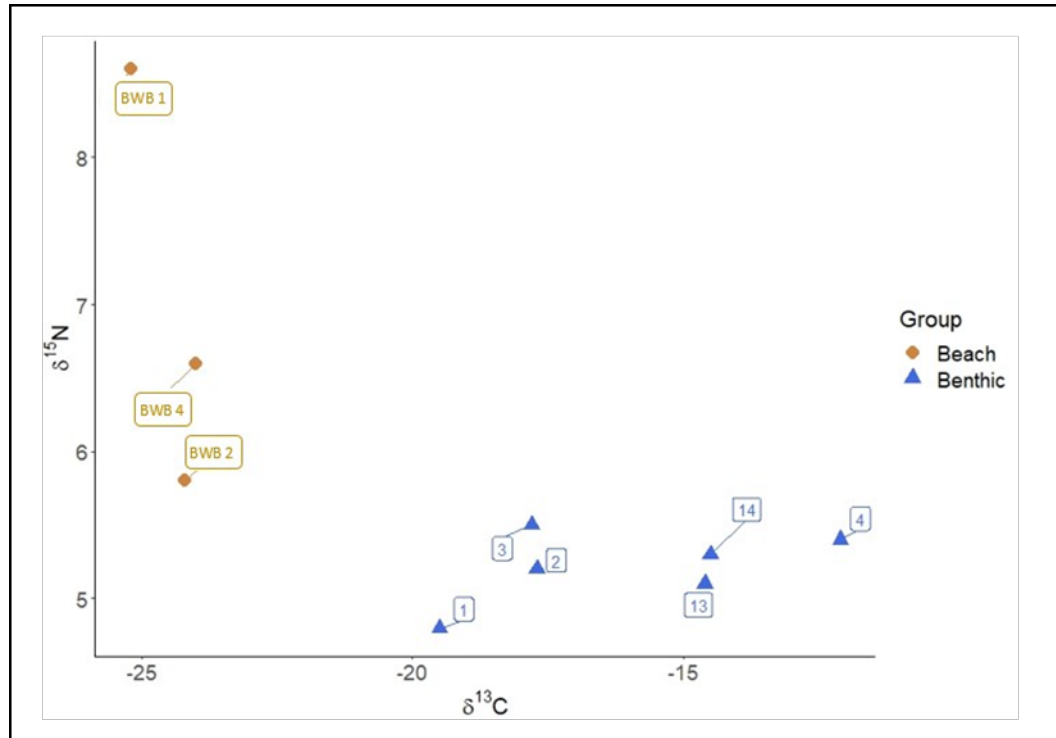


Transect Sediment Results





Stable Isotopes



Conclusions

- ▶ Both sediment and visual assessments consistent with those used in the Environmental Monitoring Program indicated that any environmental impacts related to organics from the aquaculture site were limited to the lease area
- ▶ There were no significant overlap in isotopic signals between beach sediment and farm sediment, suggesting that any excess organic materials that appear to be resulting in hypoxic or anoxic conditions at Bayswater Beach are not the result of ongoing finfish production at the aquaculture site
- ▶ The outflow of the pond, which bisects the beach, resulted in the collection of “*highly organic*” and “*likely...anoxic*” sediment (Dr. Spooner)
- ▶ Large aggregations of seaweed beds are prevalent between the farm and the beach
- ▶ Decomposition of seaweeds washed ashore could contribute to significant organic loading and accumulation

Next Steps

- ▶ Information regarding this case study was compiled into a report and posted for public viewing on the Dept website
- ▶ Take the report to the NS Aquaculture Science Advisory Committee to determine if there are recommendations that may or may not suggest further action is required to address concerns raised by residents of Bayswater, NS
- ▶ ADDED: Coastal Action with guidance from Dr. Ian Spooner conducting water sampling from pond behind Bayswater Beach

Public response to study

- ▶ Twin Bays Coalition (St. Margarets Bay & Mahone Bay) – committed to preserving and restoring marine environment; oppose open net-pen salmon aquaculture
- ▶ Insufficient research to conclude organic material from Bayswater Beach not linked to fish farm
 - ❖ Lack of reference to “seasonal sedimentological and hydrodynamic changes” of meso-tidal beaches as pathway for organics to be transported to beach
 - ❖ Sampling not during summer-fall when black sediment and odour peaked
 - ❖ Lack of explanation of decrease in sediment sulfide and organic matter from July 2020 to Dec. 2020 near fish farm
 - ❖ Inconclusive carbon and nitrogen isotope analysis
- ▶ More work requested

Thank you. Questions?

Jessica.Feindel@novascotia.ca

www.novascotia.ca/fish/aquaculture/research-development/