

PEI Aquaculture Division MSX & Dermo Project Updates

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Fisheries, Tourism,
Sport and Culture

MSX & Dermo Project Updates

1. Monthly Field Trials in Bedeque Bay & Foxley River
2. Low Salinity Immersion Trials
3. Oyster Growth Investigations



Monthly Field Trials in Bedeque Bay & Foxley River

Objective is to monitor MSX/Dermo infection, mortality rates, and oyster growth in several different seed sources.

- Dermo has not been detected at these sites.
- Started in September 2024 and is ongoing.
- Bedeque Bay (3 sites) and Foxley River (2 sites).
- Oysters held in vexar bags on-bottom.
- Data collected on a monthly basis.
- Hourly water temperature and salinity recordings.
- Oysters sunk in cages for winter (late October – late April).



Field Trials – Oyster Sources

- 2 bags of each seed source at each site (300 oysters/bag).
- Mortality assessed in each bag.
- 10 oysters collected for qPCR (and histology).

Fall 2024 (results presented today)

- 1) One year old oysters
 - Bideford “Enhancement” Oysters
- 2) Hatchery seed
 - Mallet
- 3) Wild seed
 - Mill River (Bedeque sites only)

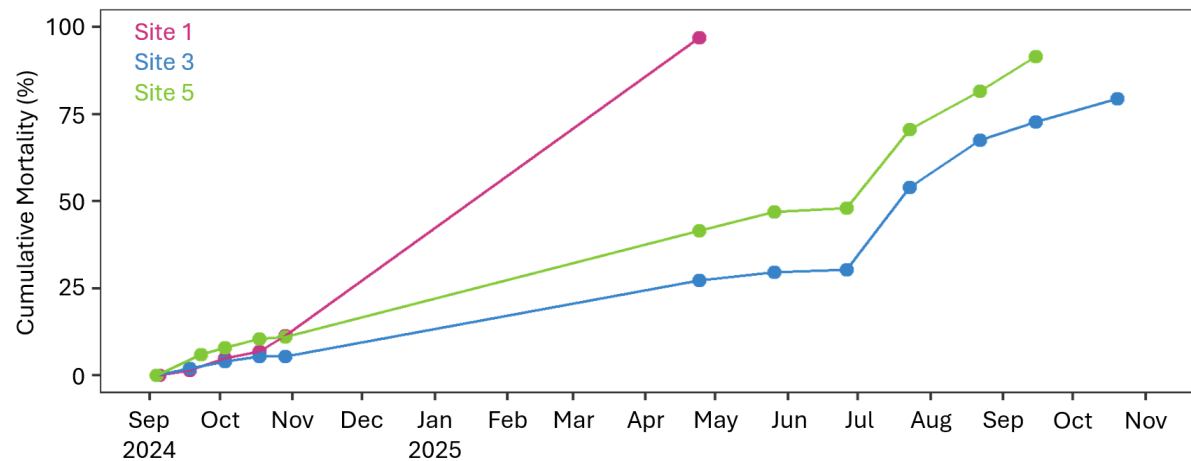
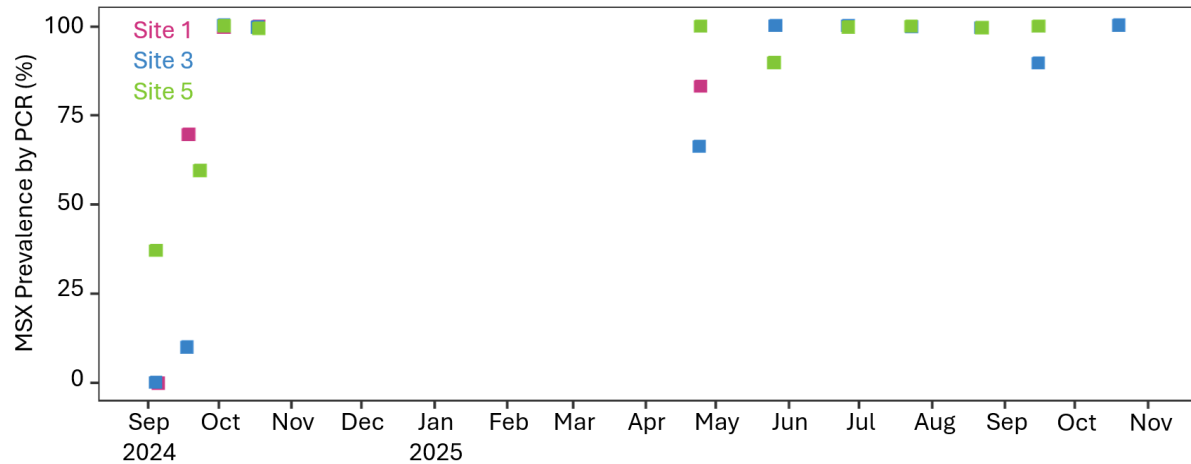
Fall 2025 (results next year)

- 1) Hatchery seed
 - Mallet
 - Bideford Shellfish Hatchery
- 2) Wild seed
 - Tracadie
 - Bedeque

Oyster Mortality and MSX Prevalence Bedeque Bay



“Enhancement” Oysters



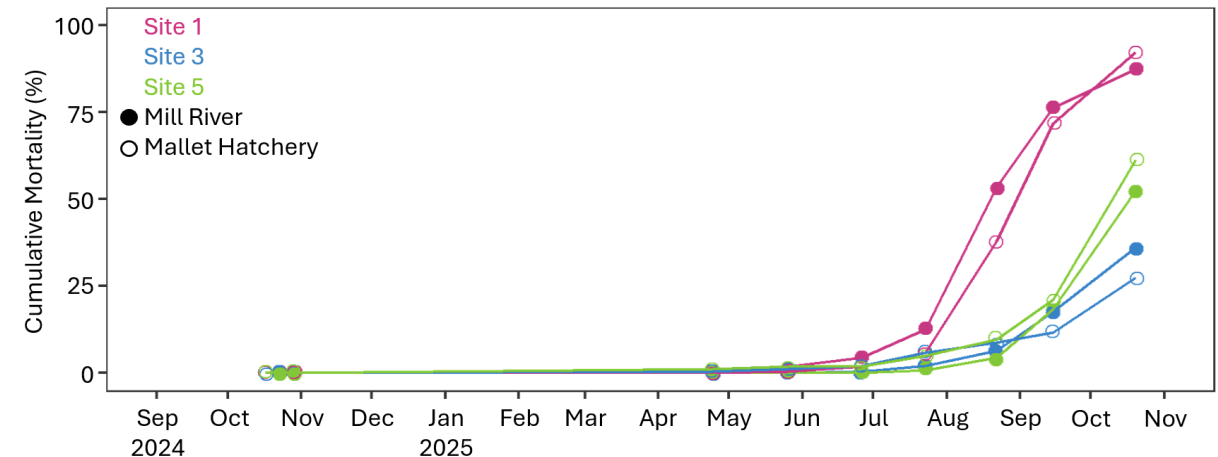
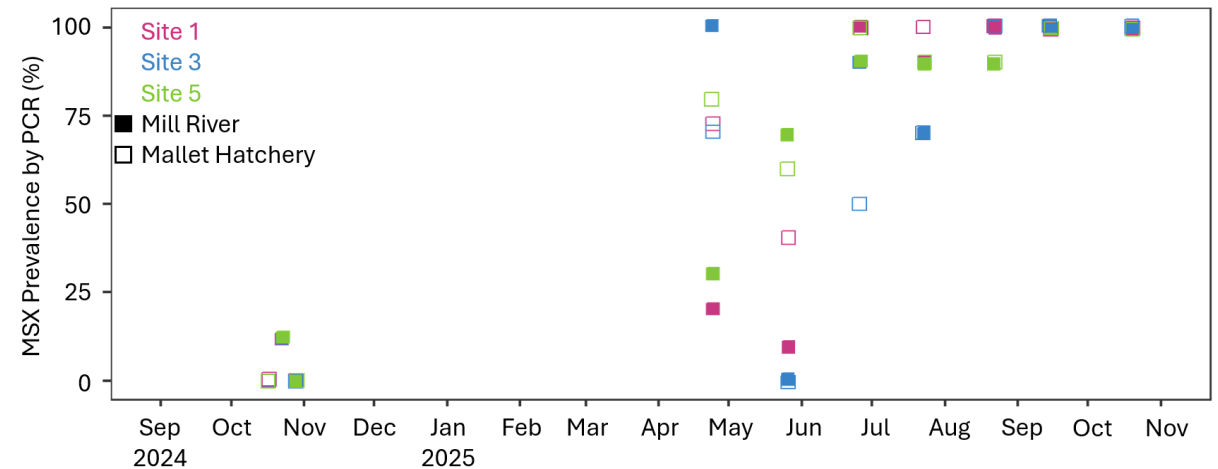
- 1 year old oysters spread in Bedeque Bay in August 2024 by the PEI Shellfish Association. Trials began in September.
- 100% (10/10) MSX prevalence at all sites by October.
- Site 1:
 - 97% mortality by April
- Site 3 & 5:
 - ~25% mortality by April
 - >50% mortality by July
 - >75% mortality by September

Oyster Mortality and MSX Prevalence Bedeque Bay



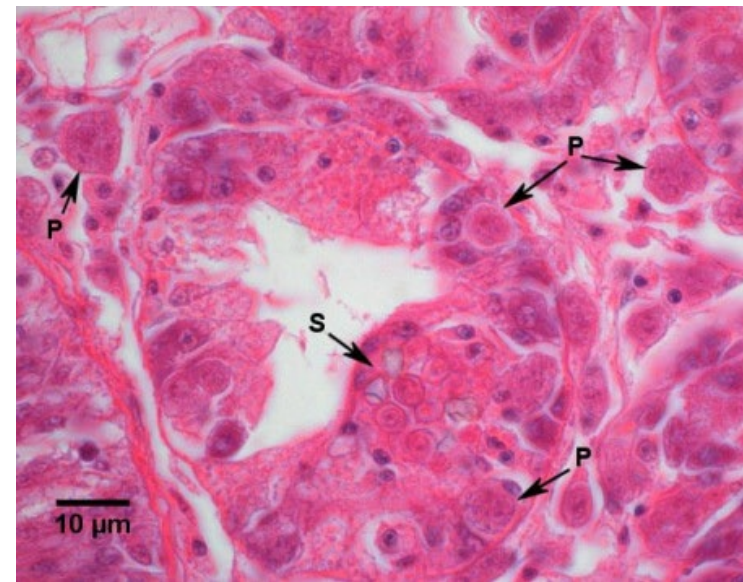
- Wild and hatchery seed introduced to Bedeque Bay in October 2024.
- MSX prevalence:
 - Variable in the spring.
 - High in the summer.
 - 100% (10/10) by September.
- Cumulative mortality low until August.
- By October 2025, cumulative mortalities of:
 - ~90% at site 1
 - ~60% at site 5
 - ~30% at site 3
- No notable difference between wild and hatchery seed (prevalence or mortality).

Wild & Hatchery Seed

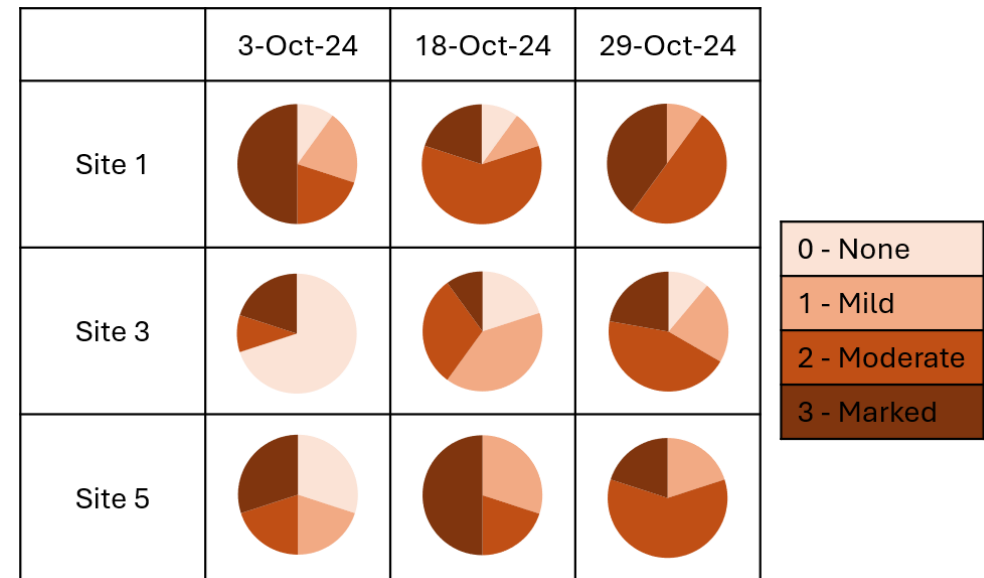


Bedeque Bay: Difference between sites

- Severe mortality occurred first at Site 1 -> Site 5 -> Site 3, despite MSX prevalence by qPCR not showing a difference between sites.
- Why?
- Need to investigate moving forward:
 - Infection dynamics via histology
 - Salinity
 - Fouling communities on the gear
 - Ecological survey at each site



Bedeque Bay
"Enhancement" Oysters

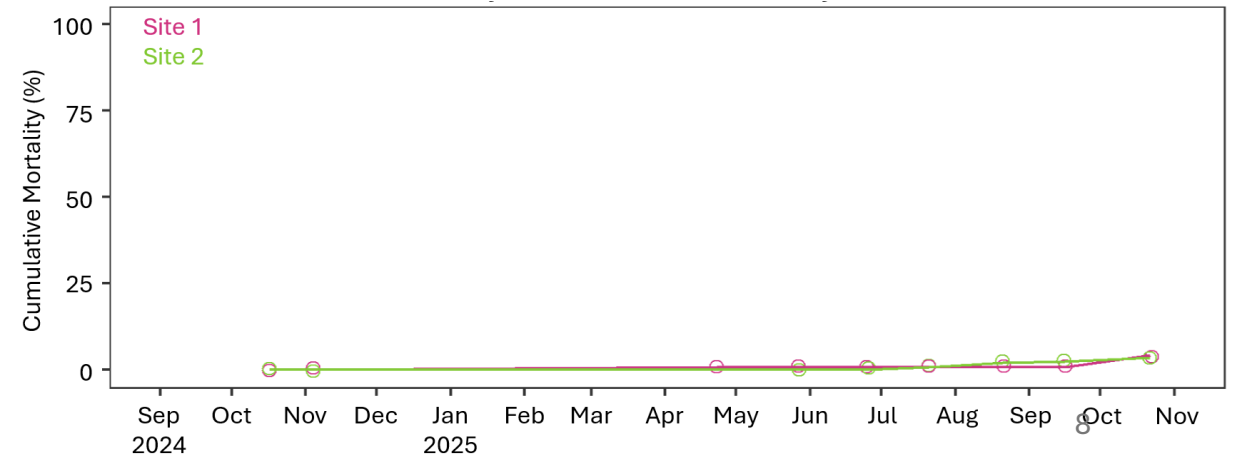
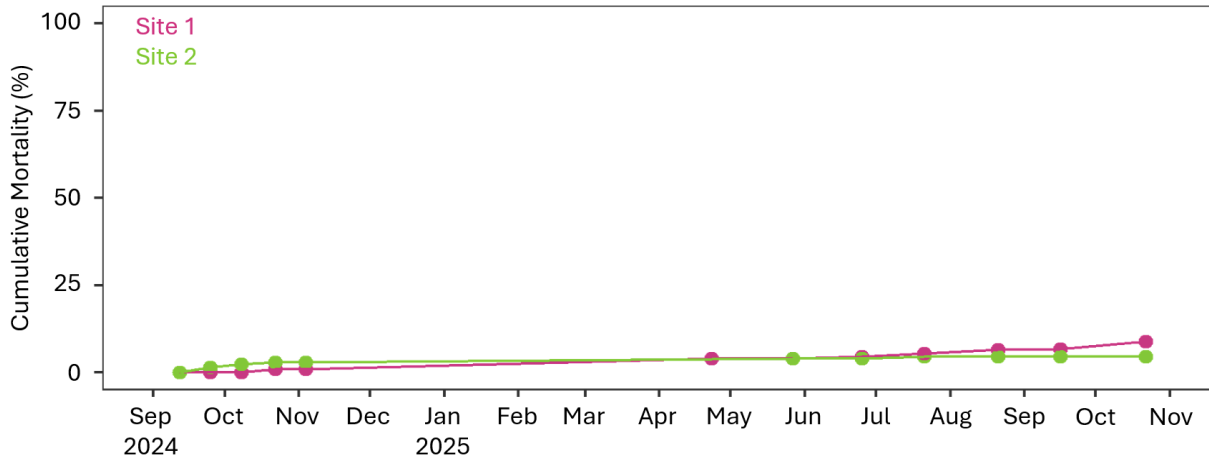
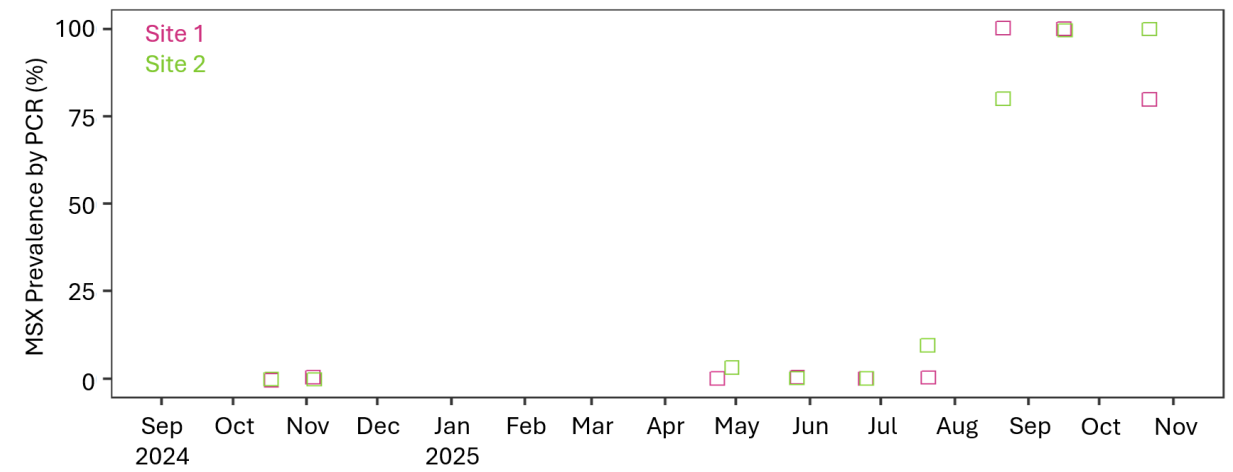
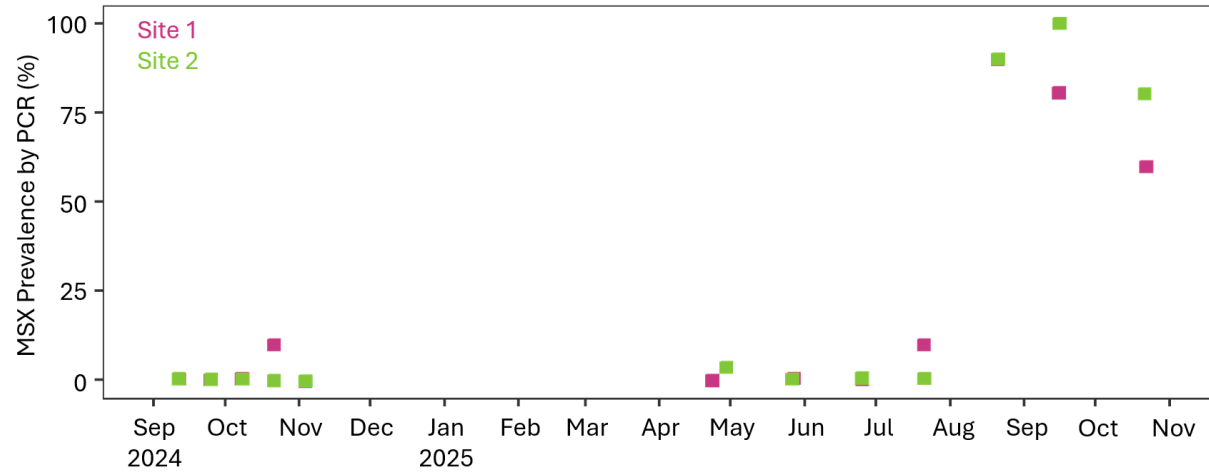


Oyster Mortality and MSX Prevalence Foxley River



“Enhancement” Oysters

Hatchery Seed



Oyster Growth

“Enhancement” Oysters			
	Fall 2024 (mm)	Fall 2025 (mm)	Growth (mm)
Bedeque Bay	38.8	49.2*	10.4
Foxley River	35.9	40.3	4.4



Hatchery Seed			
	Fall 2024 (mm)	Fall 2025 (mm)	Growth (mm)
Bedeque Bay	24.1	40.5	16.4
Foxley River	24.1	34.5	10.4



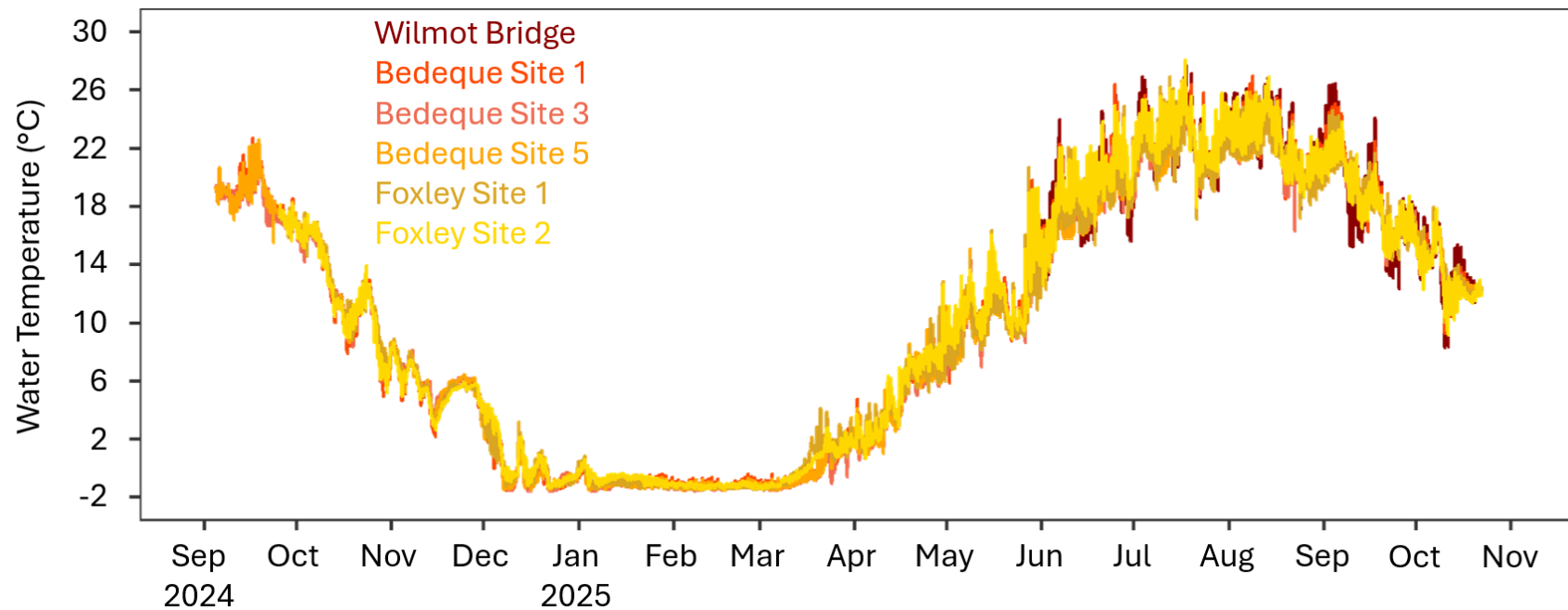
Wild Seed			
	Fall 2024 (mm)	Fall 2025 (mm)	Growth (mm)
Bedeque Bay	25.4	41.4	16.0



- Greater growth in Bedeque Bay, compared to Foxley River.
- Similar growth between the 2024 wild and hatchery seed in Bedeque Bay.

Water Temperature

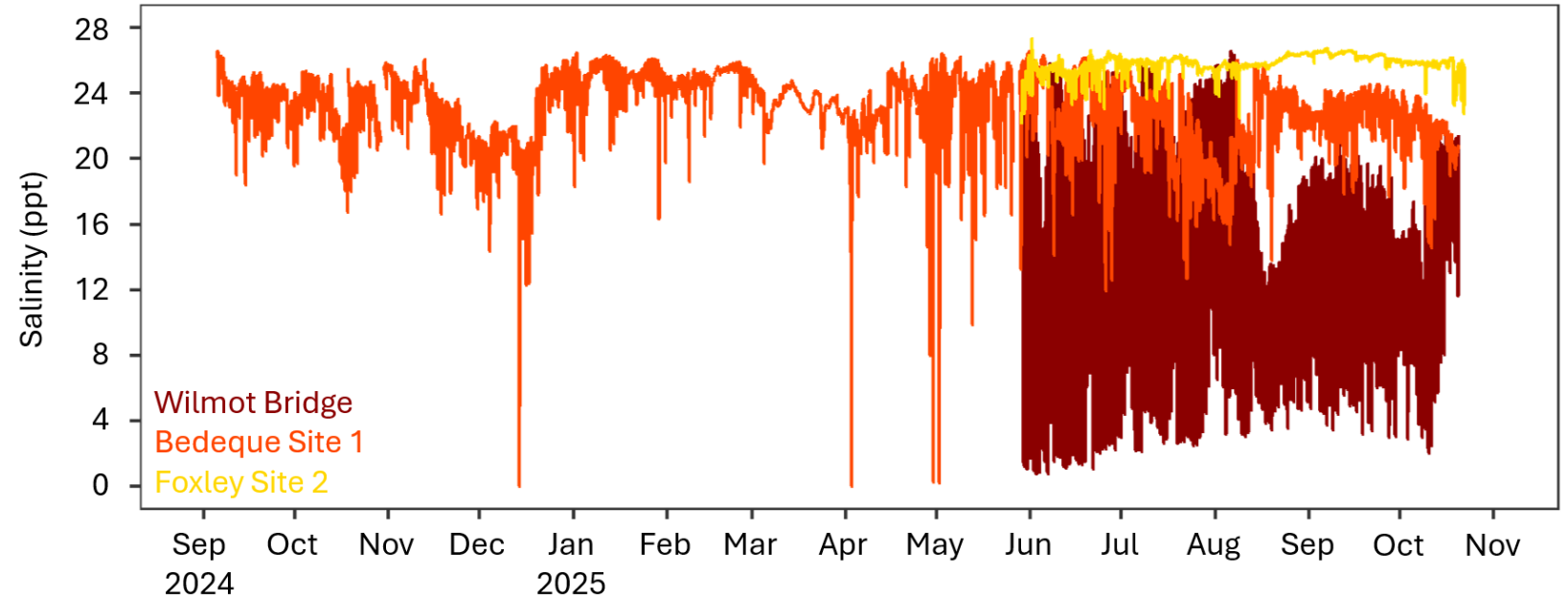
- Similar across all sites in Bedeque Bay and Foxley River.
- Water temperatures in the 5°C to 20°C range from late August to mid-November, and from mid-April to late June.
- Remained below zero (avg -1 °C) in January and February.



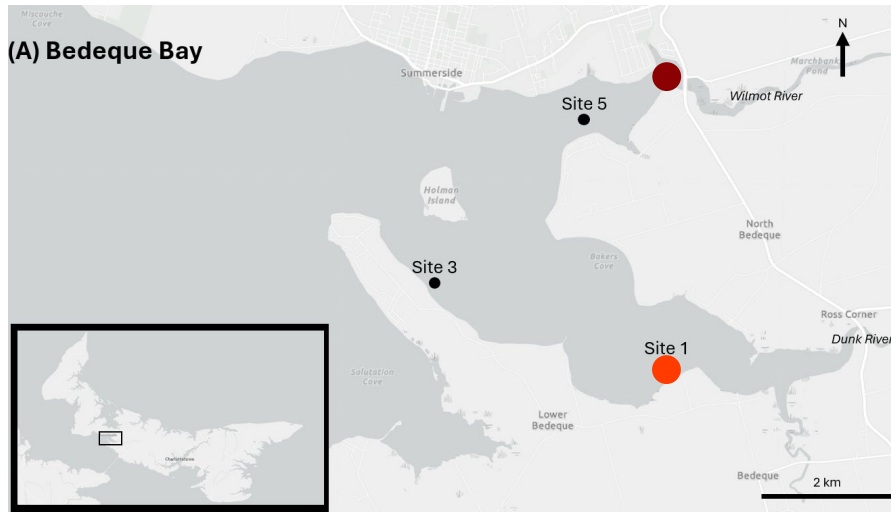
Onset HOBOTidbiT MX2203 Wireless Temperature Data Logger 400

Salinity

- Variation between sites, averaging:
 - 15ppt at Wilmot Bridge
 - 23ppt at Bedeque Site 1
 - 26ppt at Foxley Site 2
- Spring 2026:
 - Additional salinity loggers
 - Additional site at Wilmot Bridge



Star-Oddi DST CTD Logger



Low Salinity Immersion Trials

- The literature suggests immersing oysters in low salinity (8-10ppt) for 2-3 weeks, at water temperatures above 20°C.
 - Outcome = MSX decreases, no longer detectable by histology (Ford, 1985).
- Could this be a useful mitigation strategy for the industry in PEI?
- Our objective: evaluate if immersing MSX-infected oysters in a low salinity treatment will reduce infection and overall oyster mortality.
- If successful, application potentials could include:
 - Promoting small pockets of oyster sanctuaries to enhance reproduction and spat collection.
 - Prolonging survival of market-size oysters.
 - Reduced infection for I&T.

Low Salinity Immersion Trials

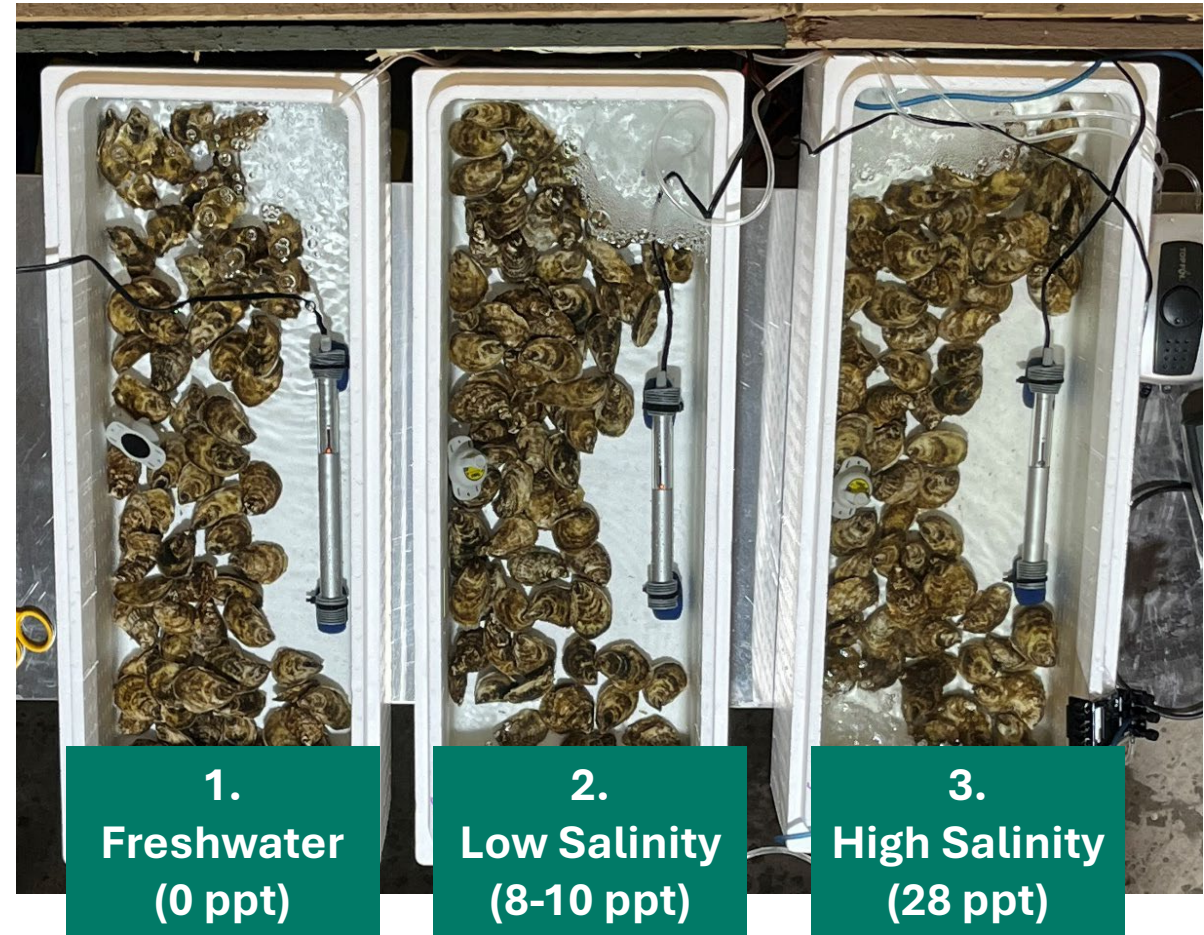
Low Salinity Conditions:

- Water temperature ~21 °C.
- Salinity ~9 ppt.
- Water aerated and circulated.
- No food input.
- Every 2-3 days:
 - Remove dead oysters.
 - Place live oysters in new water.
 - Alternating position in tank.



Low Salinity Immersion Trials: Preliminary Lab Trial – Winter 2025

- Data Outcomes:
 - MSX Prevalence (qPCR).
 - Infection/parasite viability (histology).
 - Oyster tolerance to treatment (mortality).
- Small sample size:
 - 270 oysters total.
 - Split into 3 treatment groups.
- 2 week treatment time.
- 10 oysters removed every few days for testing.
- Finished by replacing all treatments with high salinity water.
 - All remaining oysters tested on day 18.



Low Salinity Immersion Trials: Preliminary Lab Trial – Winter 2025

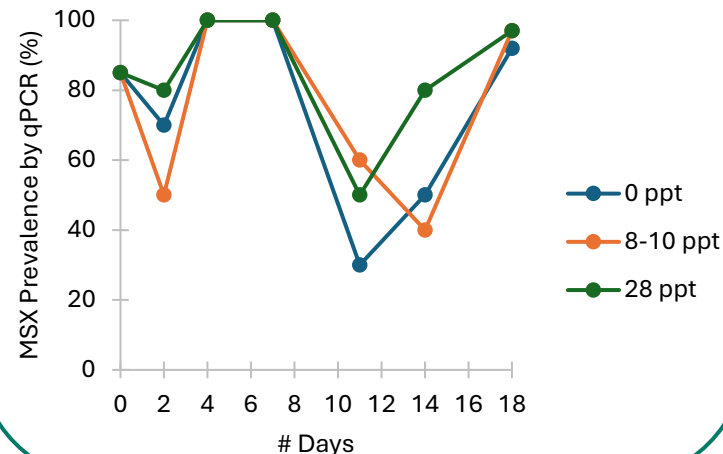
Oyster tolerance to treatment (mortality):

- ~5% mortality
- Neg. mortality switching back to high salinity after 2 weeks.



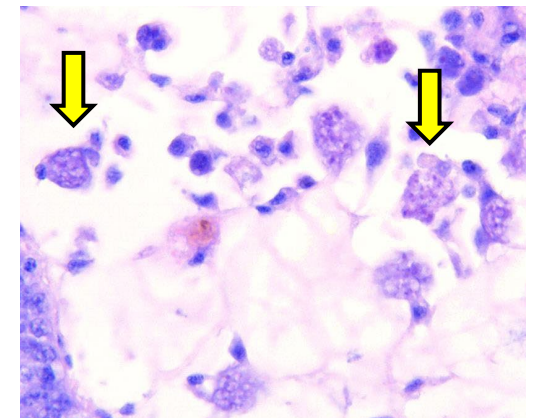
MSX prevalence (qPCR):

- qPCR detects all MSX DNA, including non-viable parasites.
- Need histology to understand dynamics.



Infection/parasite viability (histology):

- Day 7: signs of bloated plasmodium.
- Day 11: signs of degraded plasmodium.
- Need larger sample size to confirm.



Low Salinity Trials Summer & Fall 2025

Variables to be tested:

1. Exposure time
 - A. 7 days
 - B. 11 days
2. Timing and frequency of treatment
 - A. Early treatment (July)
 - B. Late treatment (October)
 - C. Both treatments
 - D. No treatment (control group)
3. Oyster size
 - A. 2023 year class (250 oysters/bag)
 - B. 2024 year class (400 oysters/bag)



-Oysters held in vexar bags in off-bottom cages (6 bags/cage).
-Triplicate bags for each group.



-700L of water in each tank.
-Up to 3000 oysters (2023) or 4800 oysters (2024) per tank.

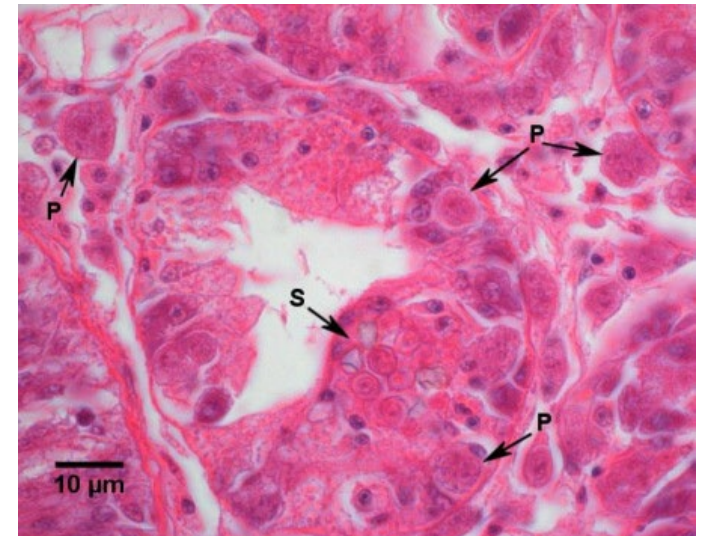
Low Salinity Trials – Diagnostic Testing

July treatment:

- Based on results from the preliminary trial in the winter, we did not conduct qPCR testing.
- Oysters from before and after the treatment were tested by histology.
- Only 1 oyster showed MSX by histology before treatment, 0 oysters after treatment.

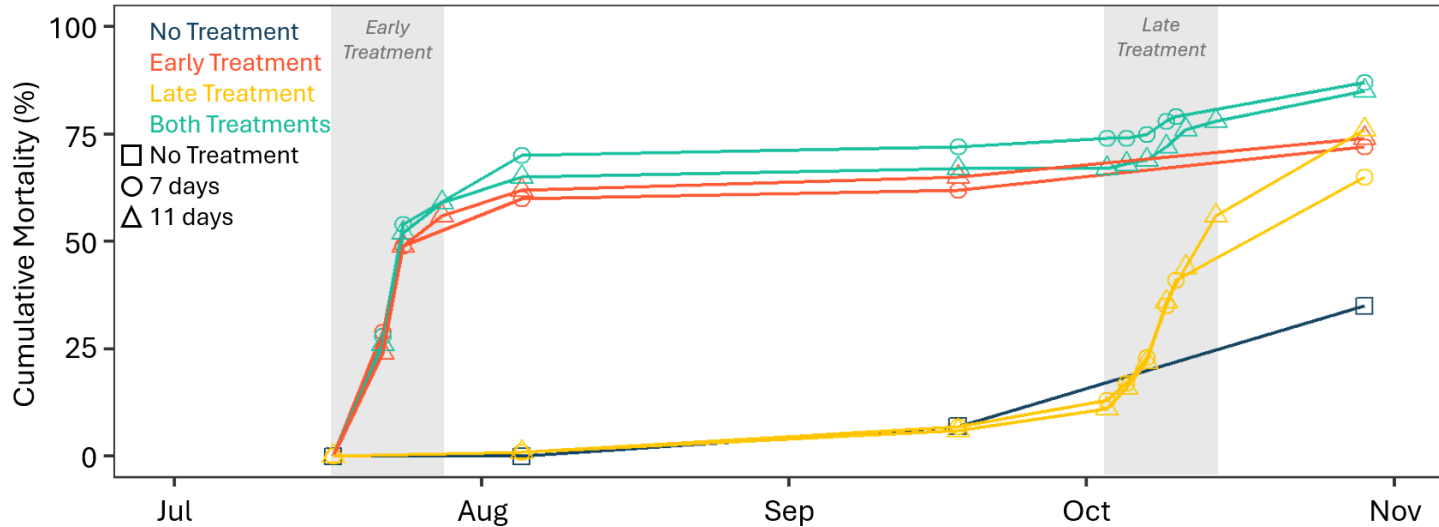
October treatment:

- Testing by qPCR and histology done before and after the treatment.
- All oysters (before and after) tested positive by qPCR.
- Histology results pending.

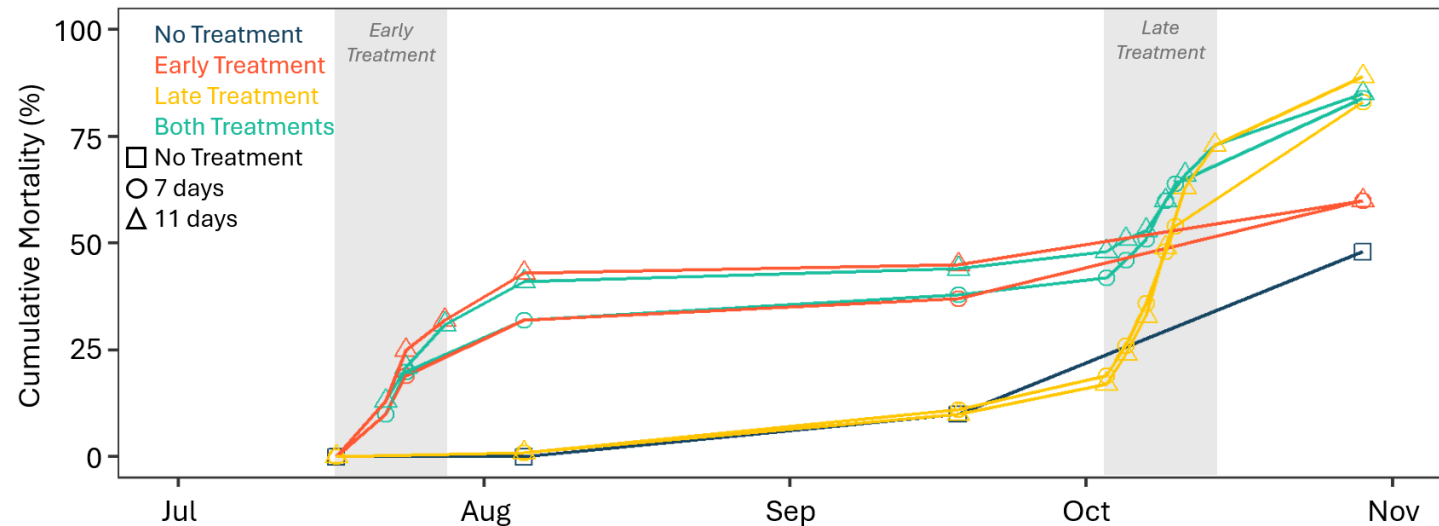


Low Salinity Trials – Mortality & Growth

2023 Year Class



2024 Year Class



Cumulative Mortality:

- 60-90% in the groups that were treated in low salinity.
- 35-50% in the control group (no treatment).
- Too weak from MSX infection?
- Need better tank conditions?
- Will be assessing final mortality in Spring 2026.

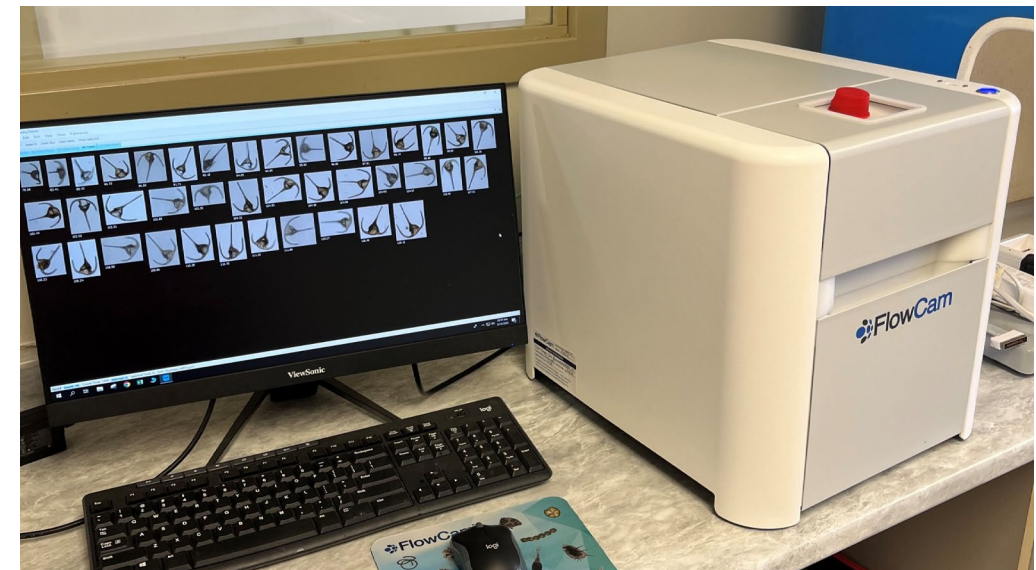
Oyster Growth:

- Oyster lengths measured in July and October.
- 2023 oysters: “negative growth”
 - Greater mortality in larger oysters within the age class?
- 2024 oysters: 1-3 mm growth
 - Much less than a typical year.

Oyster Growth Investigations

Objective is to investigate the relationship between oyster growth, food availability (chl, plankton content), and local MSX/Dermo prevalence.

- 5 sites: Percival, Foxley, Bideford, Rustico, Orwell
 - Plankton samples also collected in Bedeque Bay
- Oyster growth data collected as part of the Oyster Monitoring Program.
 - Seed, 1st year, 2nd year
- Chlorophyll measurements recorded using aquaMeasure sensor.
- Water samples collected from June to October.
 - Tube method – entire water column
 - FlowCam imaging: food availability and quality, taxonomic composition, biovolume
- Data analysis in progress.





**Fisheries, Tourism,
Sport and Culture**

THANK YOU!

QUESTIONS?

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