

MSX in Prince Edward Island: Provincial Surveillance and Monitoring

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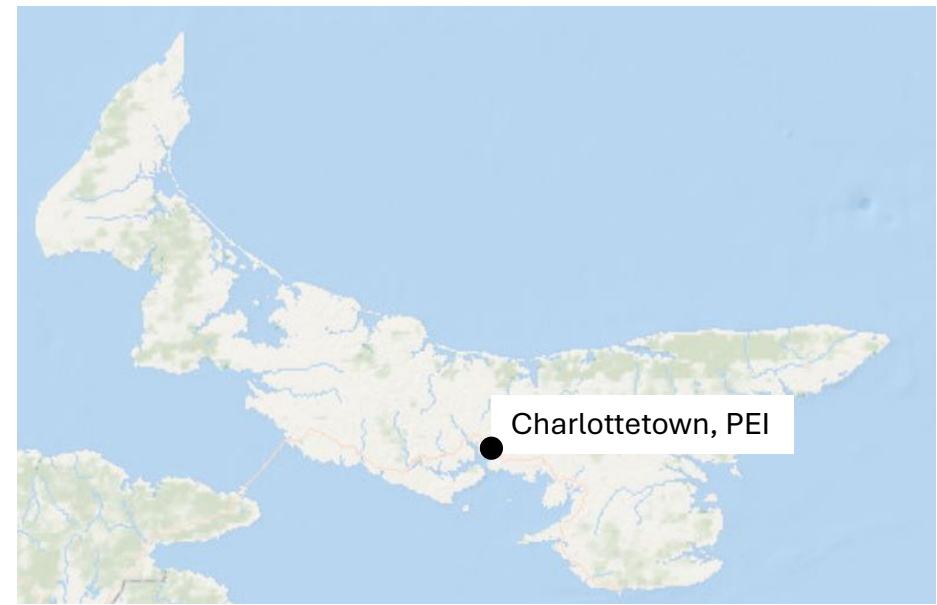


**Fisheries, Tourism,
Sport and Culture**

PEI FTSC

Aquaculture Division

Provide advice, assistance, and information to support the development of the aquaculture and shellfishing industries.



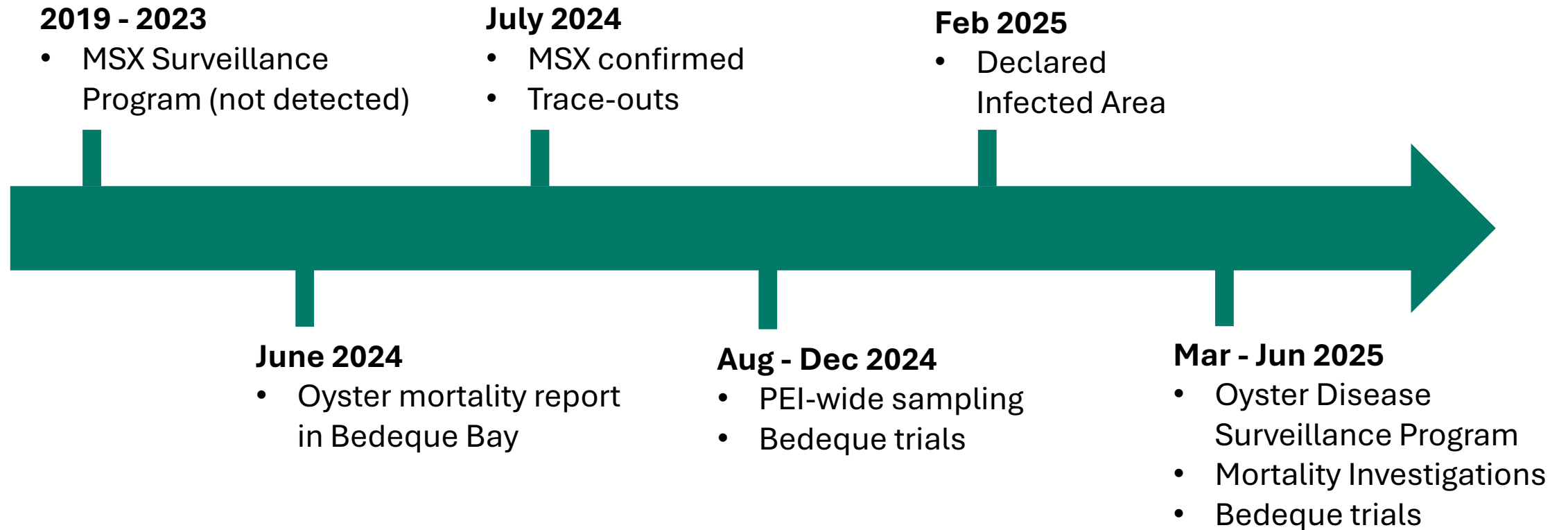
Technical Programs	• Mussel Monitoring Program (larvae, meat yield, water temperature, phytoplankton, predators and fouling) • Oyster Monitoring Program (larvae, oyster growth, tunicates, water quality) • Oyster Disease Surveillance Program (MSX, Dermo, SSO)
Biological Services	• Canadian Shellfish Sanitation Program (CSSP) – Conditionally Managed Areas • Certificate of Health for Transfer (COHFT) – Finfish policy • Shellfish Mortality Investigations
Financial Programs	• Support growth, innovation, and research • Ex: Atlantic Fisheries Fund
Access Sites	• Manage over 100 access sites for fishing and aquaculture operations

MSX Surveillance (Pre-detection)

- Annual Surveillance Program
 - Pilot MSX Surveillance Project in 2019 – 6 areas
 - In 2023, 17 sites were sampled
 - Oysters collected in Aug/Sep
 - Histology (AVC)
 - No MSX or Dermo detected
- Mortality Investigation
 - Respond to industry reports
 - Questionnaire – dates, product information, husbandry practices, environmental changes, mortality specific information
 - No MSX or Dermo detected



MSX Timeline in PEI



MSX Info Hub Website

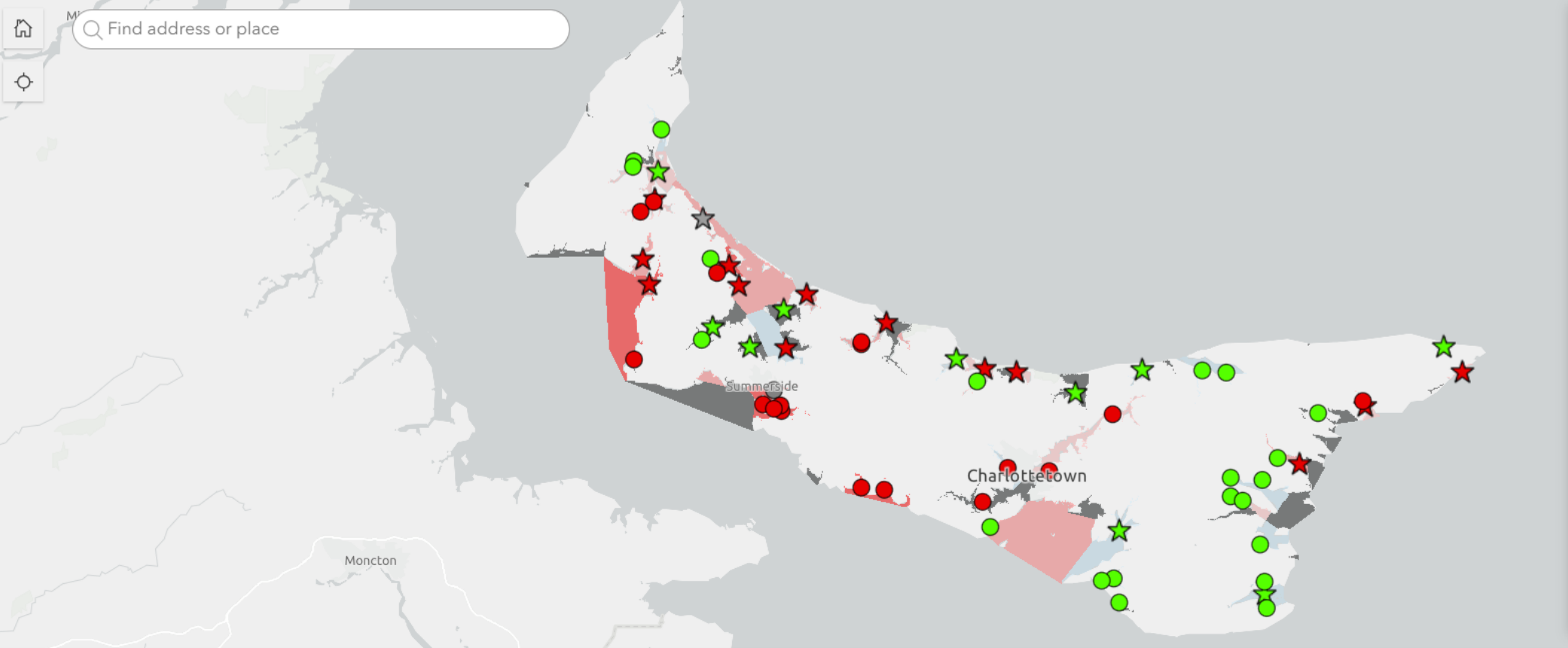
Initiative by the PEI MSX Task Force

- Membership composed of government (DFO, PEI) and industry (PEI Aquaculture Alliance, Shellfish Association, Seafood Processors & Oyster Processors).
- Purpose – central forum for MSX activities.





Find address or place



Legend

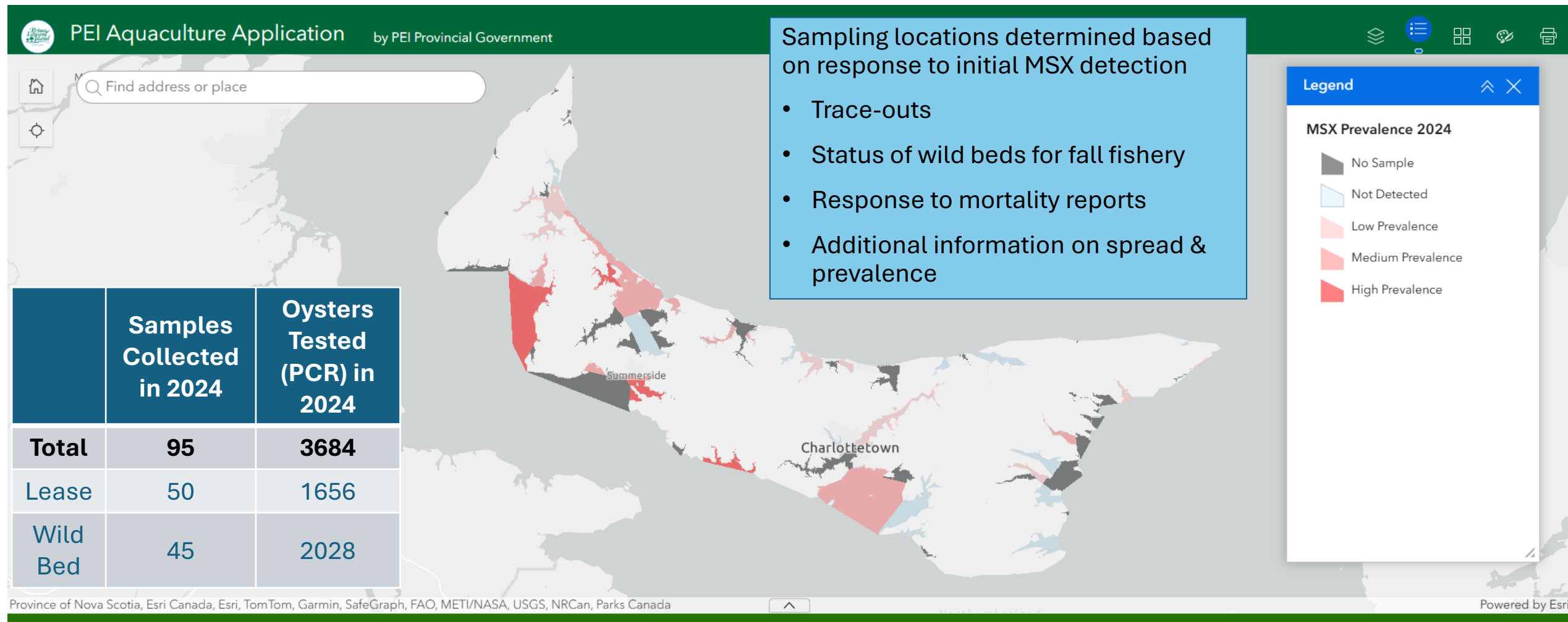
Disease Surveillance 2025

- ★ Cultured, MSX Positive
- ★ Cultured, Not Detected
- ★ Cultured, Not Sampled
- Wild Bed, MSX Positive
- Wild Bed, Not Detected
- Wild Bed, Not Sampled

MSX Prevalence 2024

- No Sample
- Not Detected
- Low Prevalence
- Medium Prevalence
- High Prevalence

MSX Prevalence 2024 (PEI FTSC & CFIA)



MSX Prevalence 2025 (PEI FTSC)

PEI Aquaculture Application by PEI Provincial Government

Find address or place

	Samples Collected in spring 2025	Oysters Tested (qPCR) in spring 2025
Total	164	5340
Lease	124	3552
Wild Bed	40	1788

Oyster Disease Surveillance Program

- Help oyster growers, fishers, and processors make informed decisions.
- Spring and fall sampling
- Cultured and wild beds
- Mortality follow-up
- qPCR for MSX & Dermo

Legend

Disease Surveillance 2025

- ★ Cultured, MSX Positive
- ★ Cultured, Not Detected
- ★ Cultured, Not Sampled
- Wild Bed, MSX Positive
- Wild Bed, Not Detected
- Wild Bed, Not Sampled

Results so far...

- MSX prevalences ranging from 0 to 100%.
- Highest MSX prevalences observed in the south/west.
- Many sites in the east where MSX has not been detected.

Bedeque Bay

- Important bay for the wild oyster fishery.
- No aquaculture.
- First MSX detection in PEI.

MSX Surveillance

- Document MSX infection and estimated mortality
- 5 sites
- July to December 2024
- Oysters collected by tonging
- Mortality (“live” vs “dead”)
- Histology



Estimated mortality (by tonging)

- Increased from an average of 34% in August to 76% in November.
- Similar across sites (except site 2).

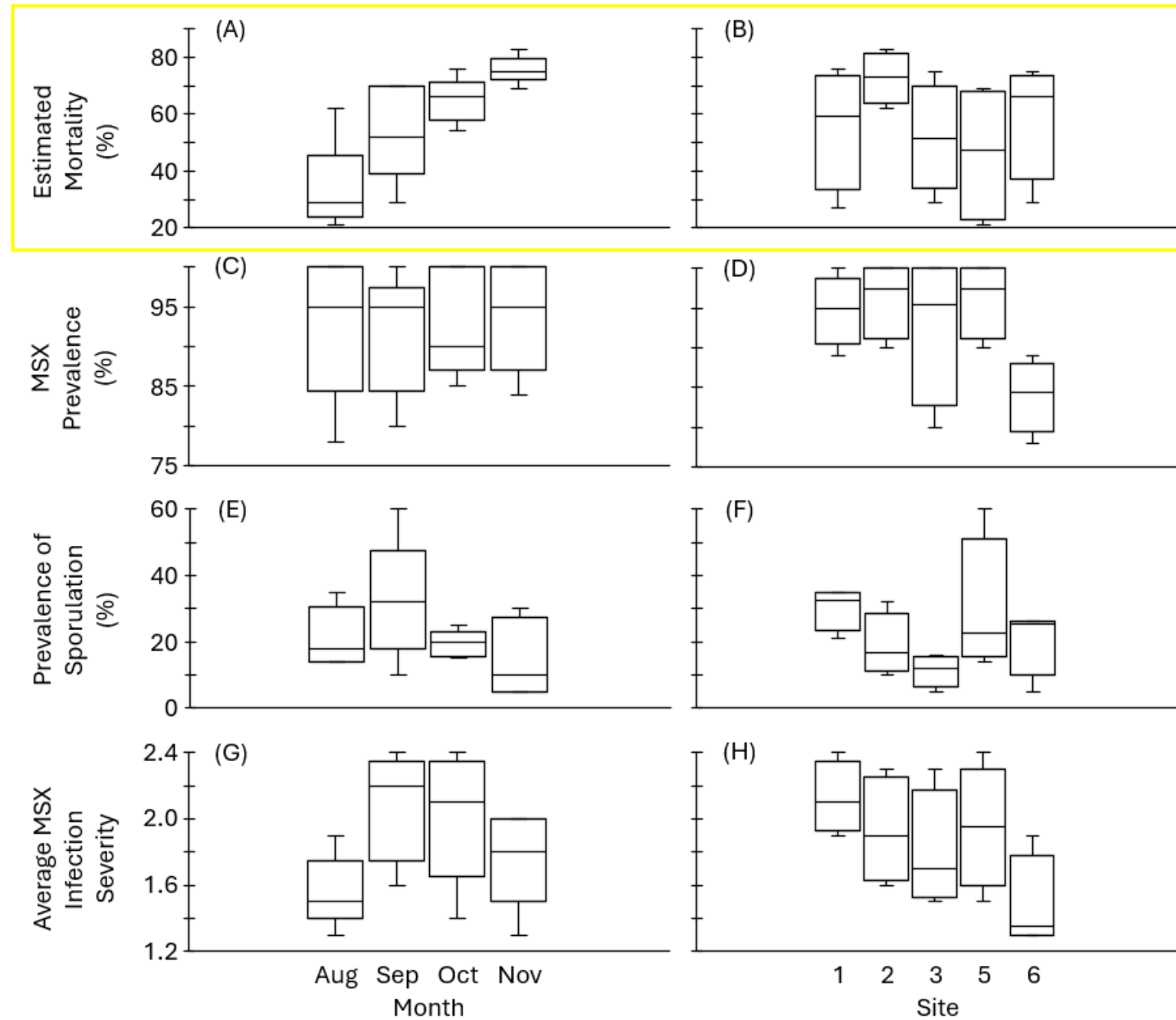
Example:

Site 1 - November 26, 2024



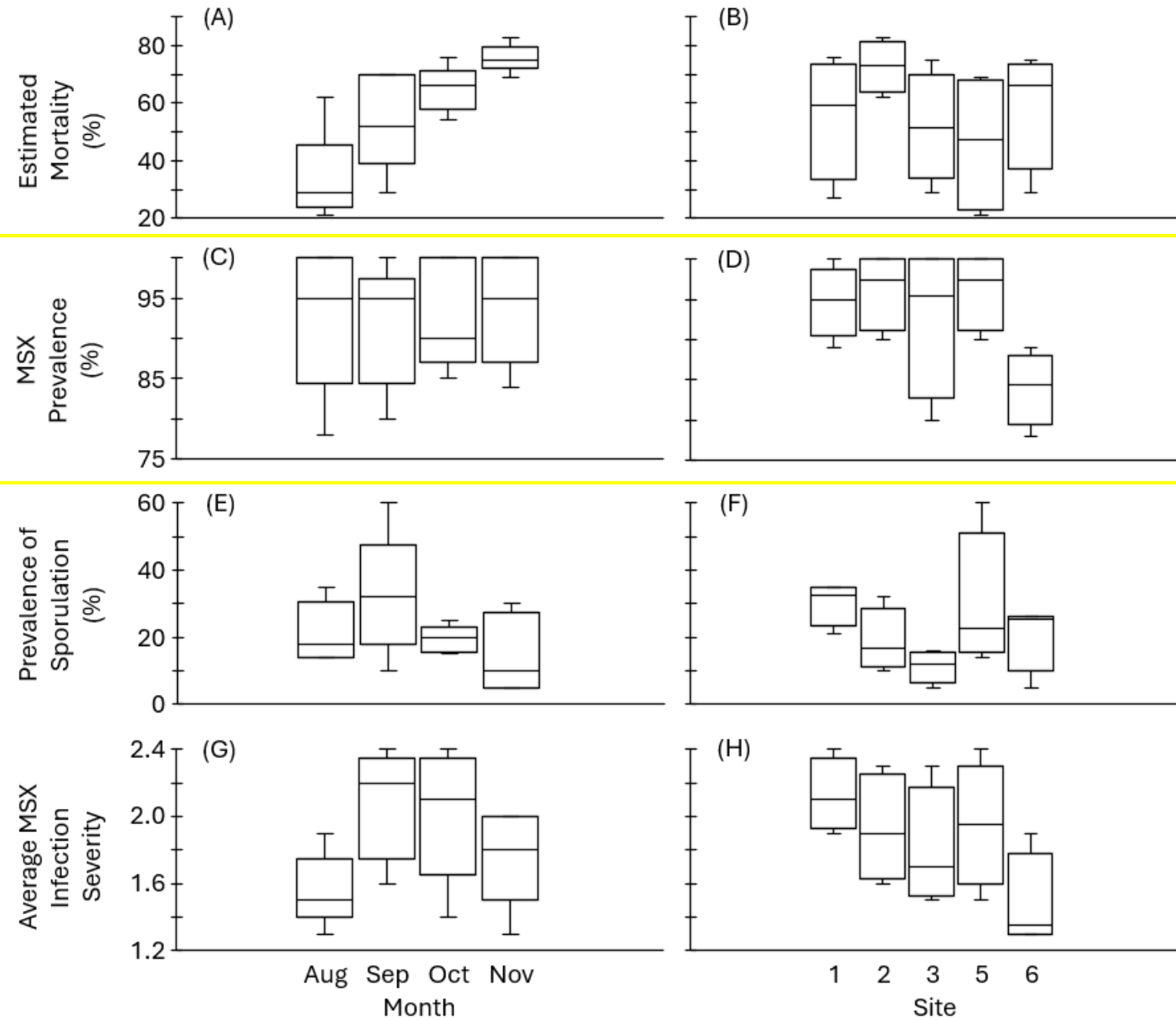
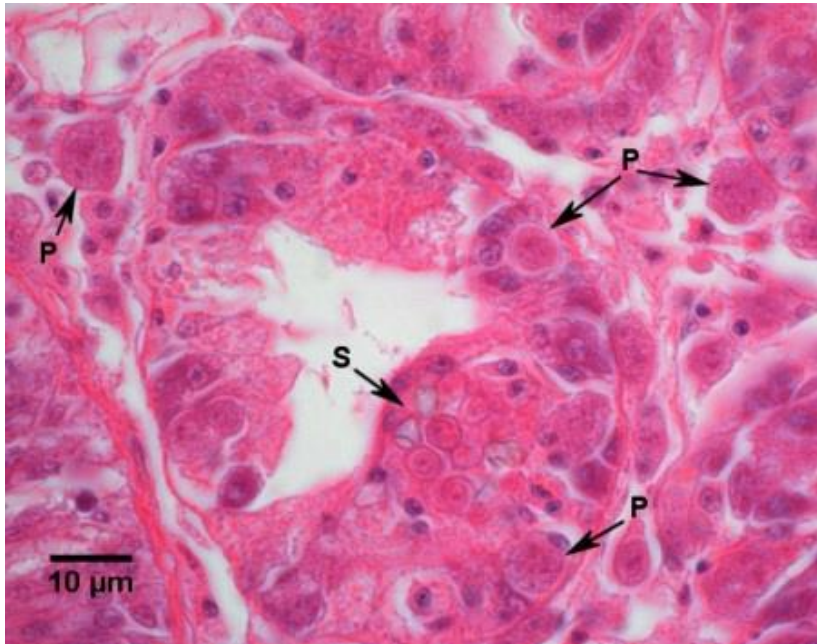
LIVE

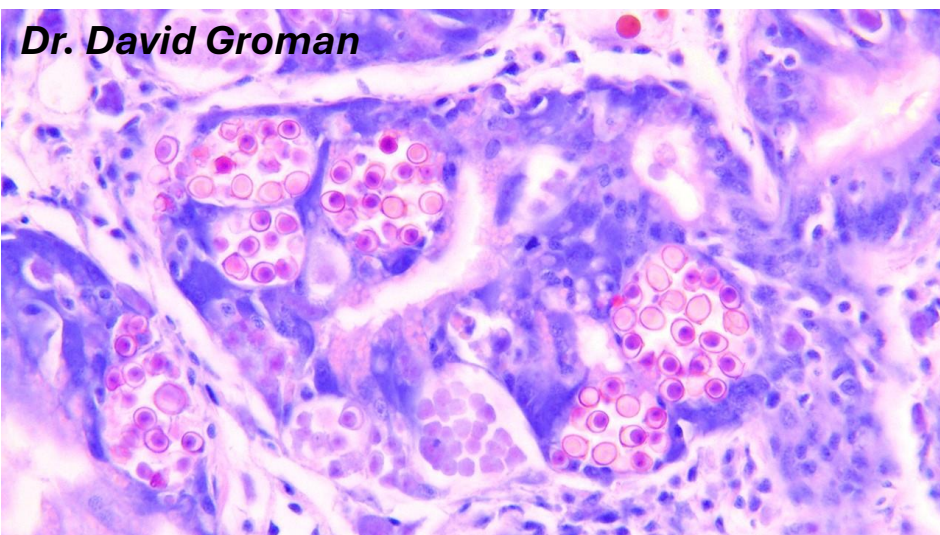
DEAD



MSX prevalence (histology)

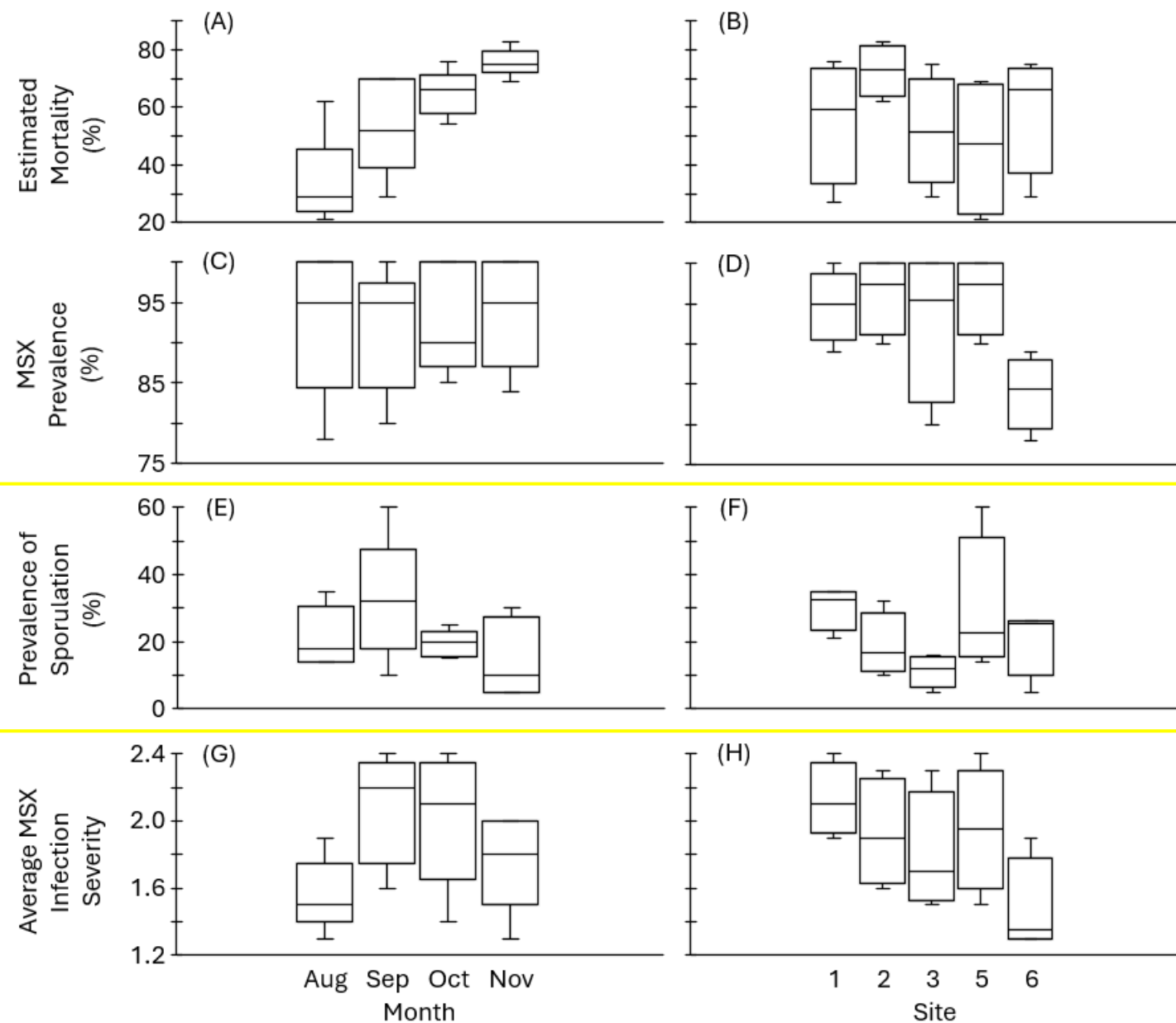
- Average of 93% from August to November.
- Significantly higher than July (average 26%).
- Similar across sites (except site 6).



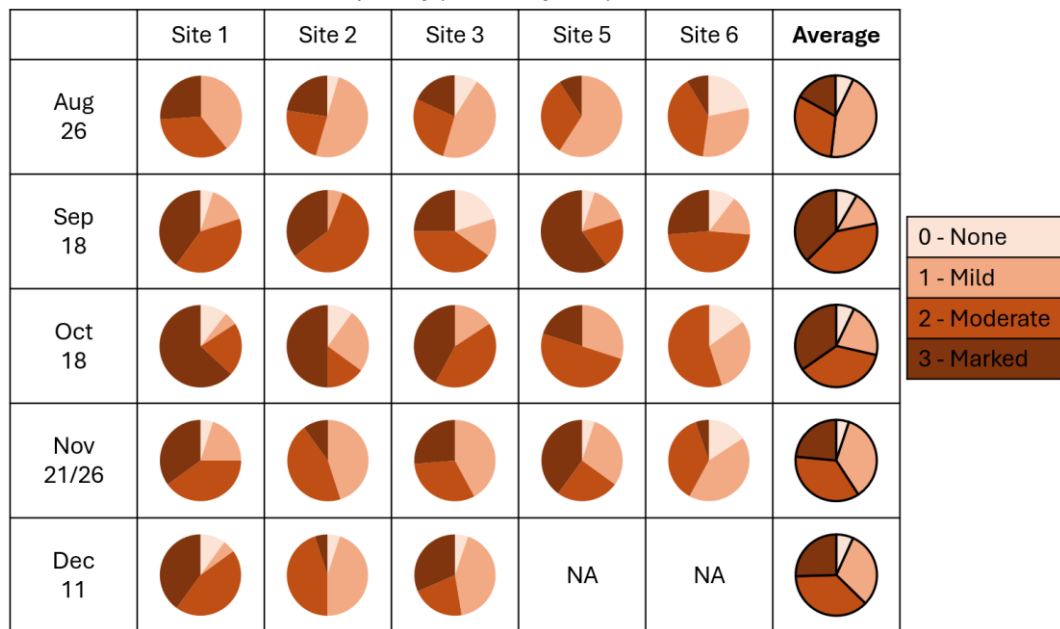


Prevalence of sporulation (histology)

- Up to 60% prevalence of sporulation in mature oysters in Bedeque Bay.
- Past studies in the USA have found <1% in mature oysters (>80% in juveniles).

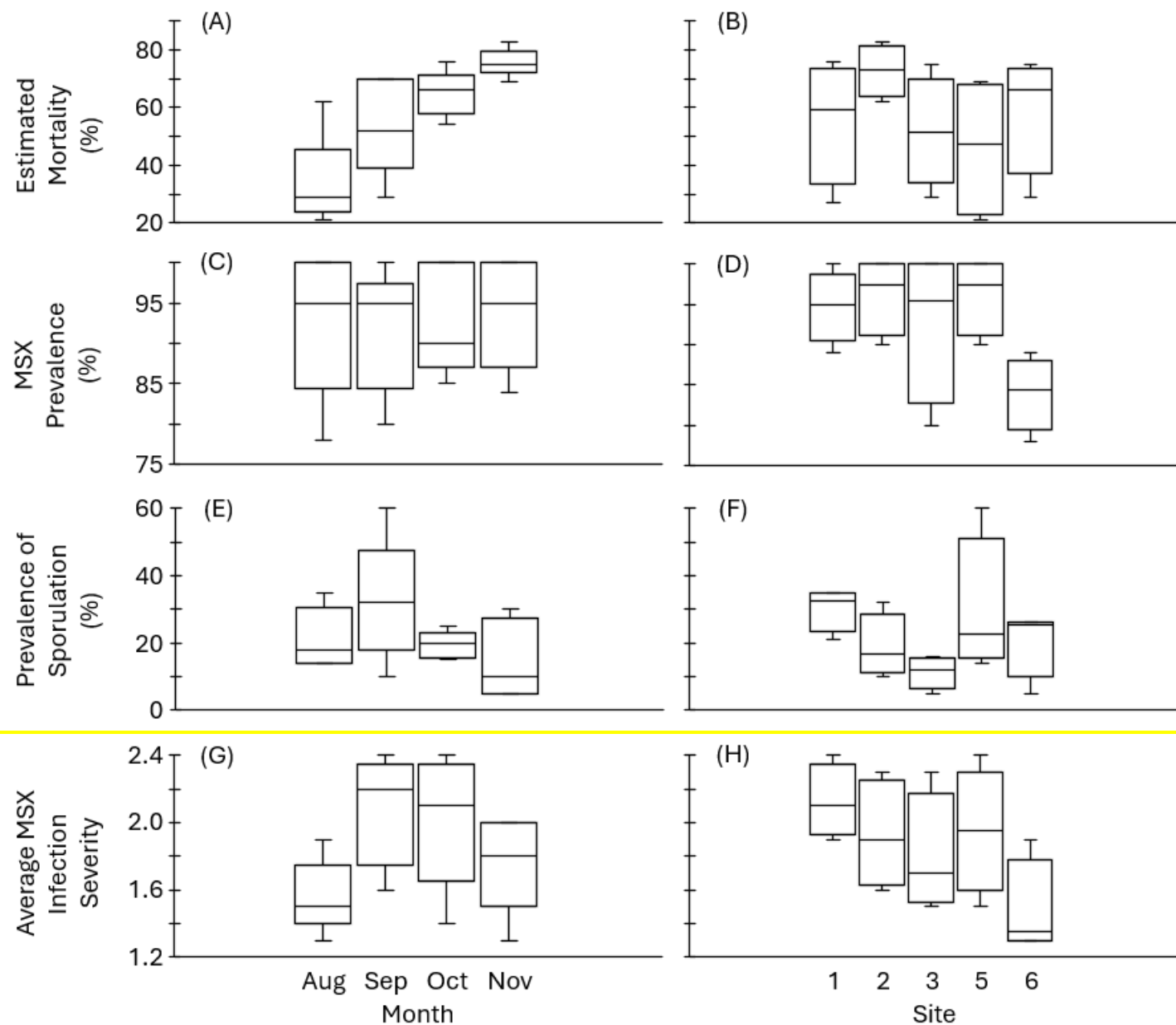


Bedeque Bay (Mature Oysters)



Infection Severity (histology)

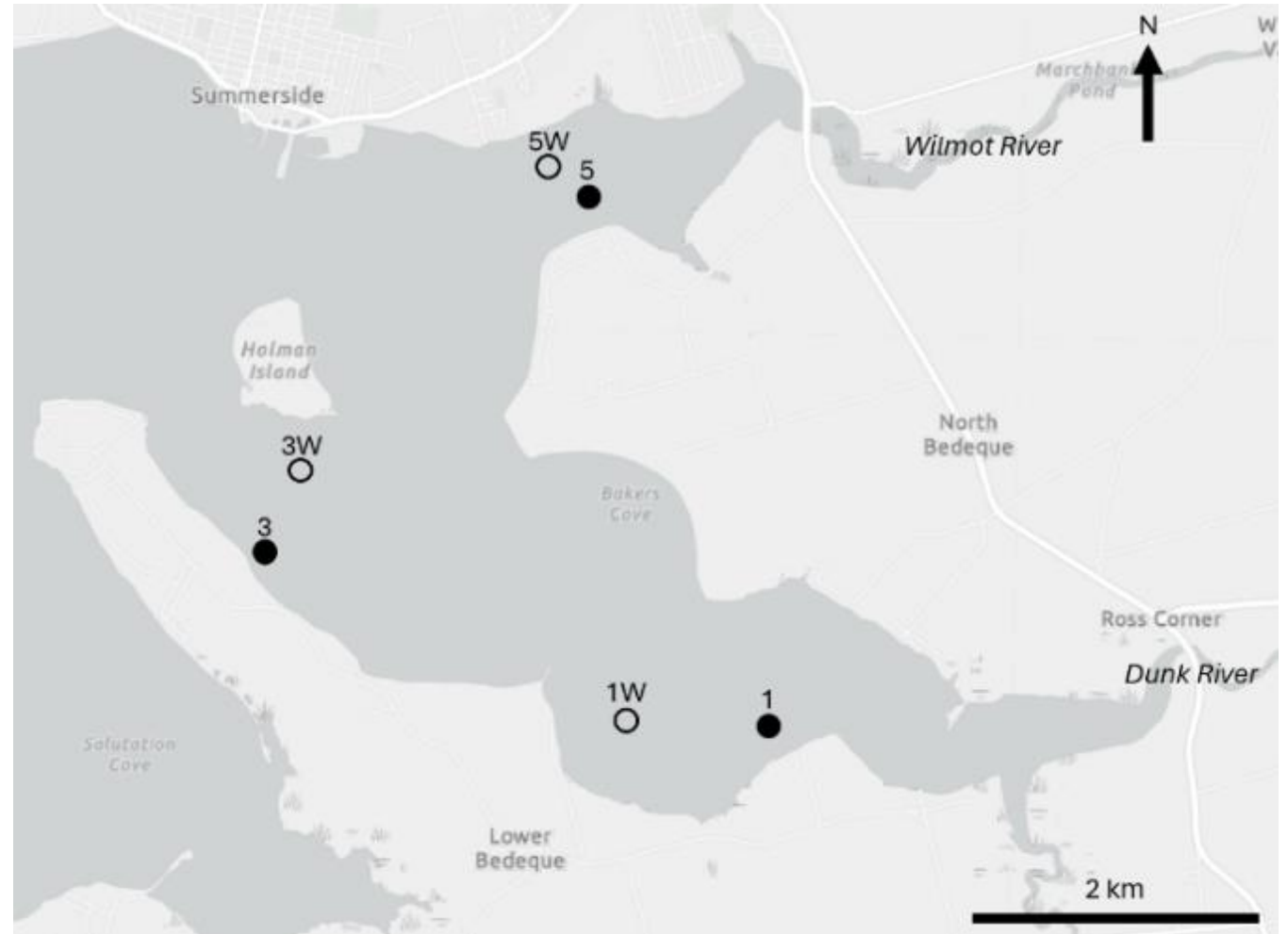
- Average severity per sample ranged from 1.3 to 2.4 on a scale of 0 to 3.
- Lowest at Site 6.

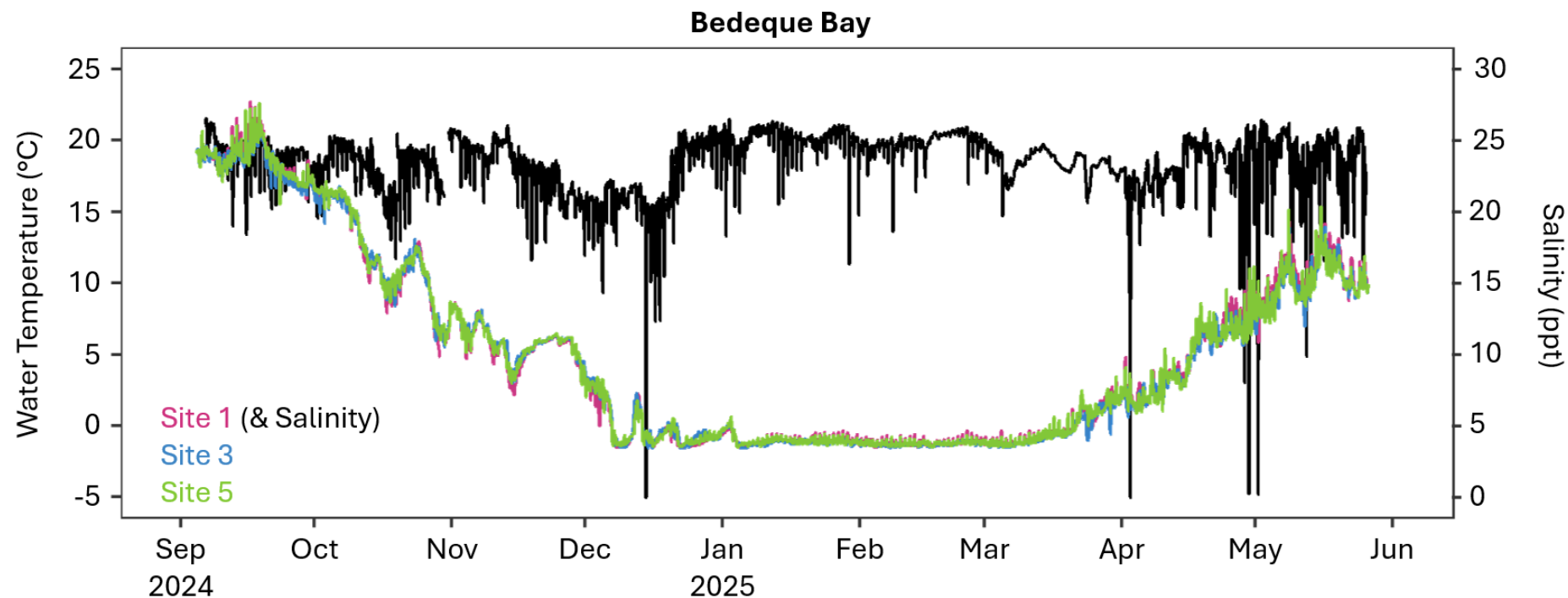


Bedeque Bay

MSX Trials

- Started in September 2024 (still ongoing)
- 3 sites
- Held oysters in vexar bags on-bottom
- Track infection (PCR) and mortality rates
- Temperature and salinity





Water Temperature

- High of 23 °C in September.
- Remained below zero (avg -1 °C) in January and February.
- High of 15 °C in May.

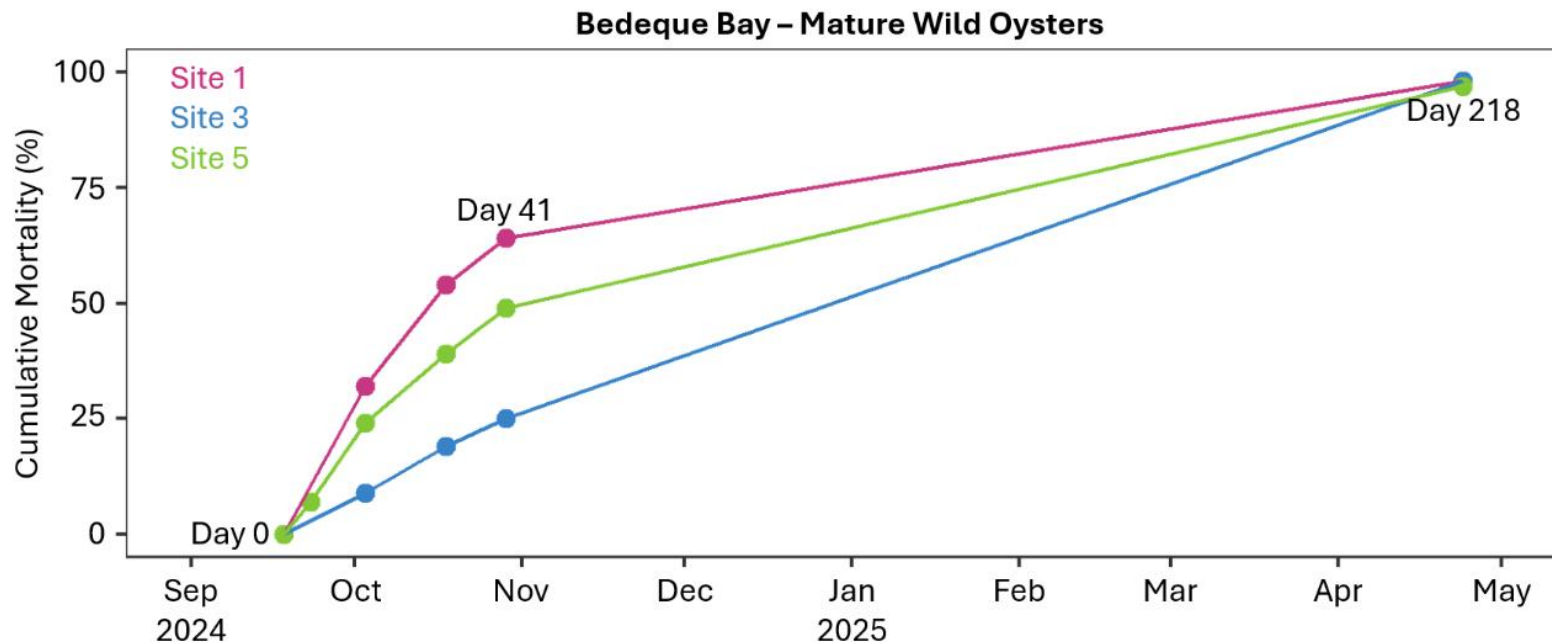
Salinity

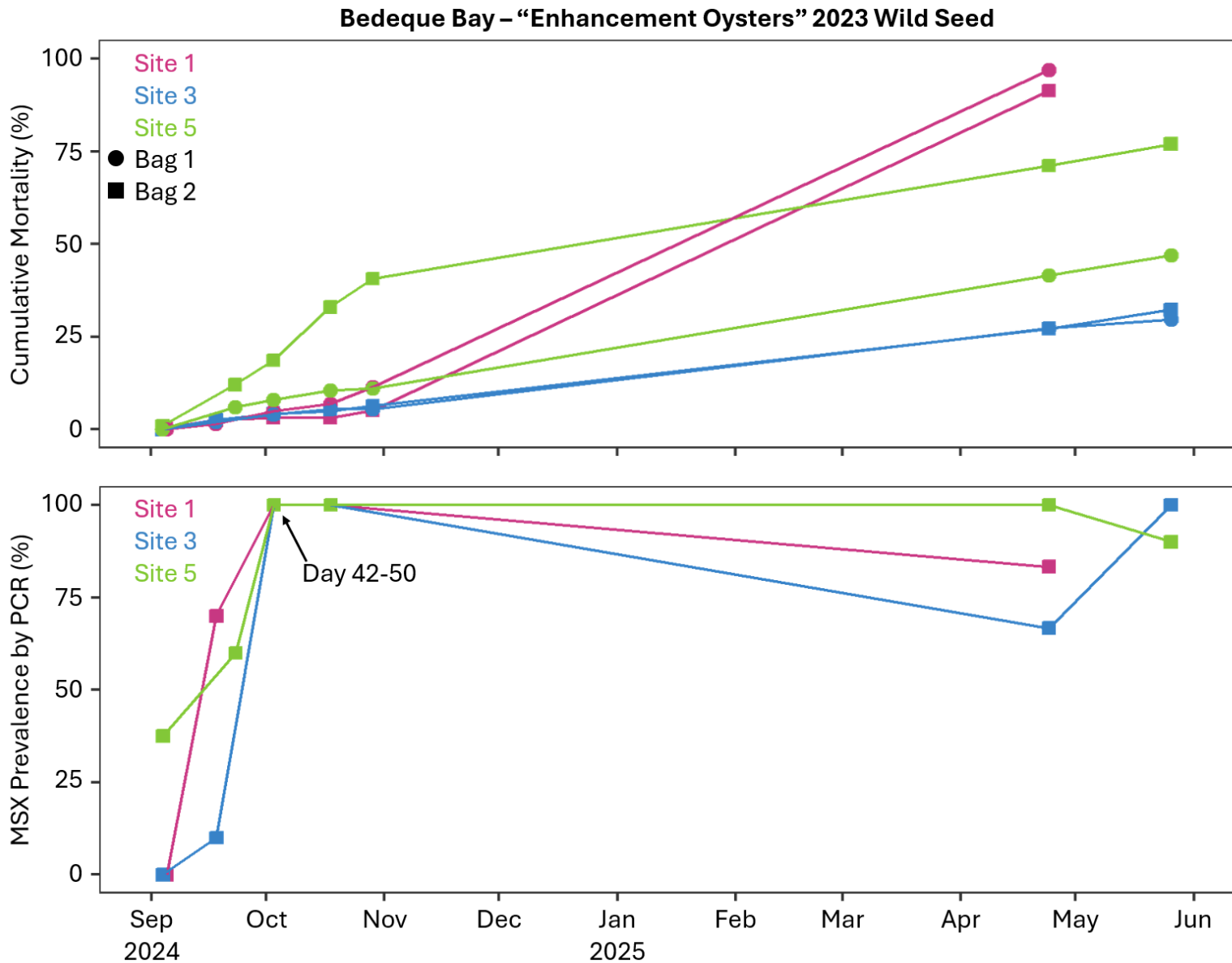
- Generally ranged from 15 ppt to 26 ppt.
- Monthly averages between 22 ppt and 25 ppt.



Improved Method to Assess Mortality?

- Collected 100 oysters at 3 sites
- Held in Vexar bags, anchored bags to the bottom.
- Cumulative mortality assessed every 2 weeks in September and October 2024, then reassessed in April 2025





Trial Set-Up

- Oysters (2023 year class) spread in Bedeque Bay by the PEI Shellfish Association in August 2024.
- 2 bags at each site (200 oysters/bag).
- Testing cumulative mortality and infection rates (PCR, n=10).

Results

- All sites reached 100% MSX prevalence after 1.5 months.
- Cumulative mortalities up to 97% by April 2025.

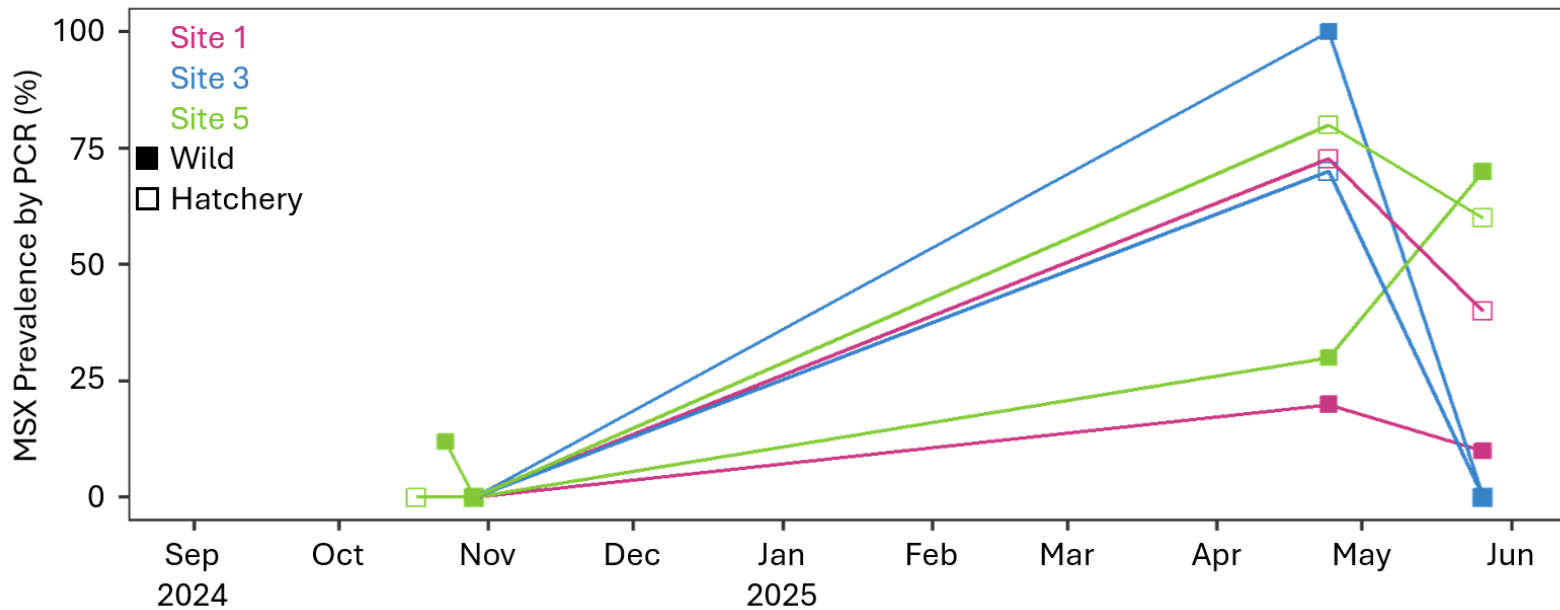
2024 Wild Seed
~ 25 mm



2024 Hatchery Seed
~ 25 mm



Bedeque Bay – 2024 Seed (Wild & Hatchery)



Trial Set-Up

- Wild caught and hatchery produced seed (2024 year class) introduced to Bedeque Bay in mid-October 2024.
- 2 bags at each site (300 oysters/bag).
- Testing cumulative mortality and infection rates (PCR, n=10).

Results

- Cumulative mortality remained low (<5%) in all bags.
- Variable MSX prevalence values in both the wild and hatchery seed.

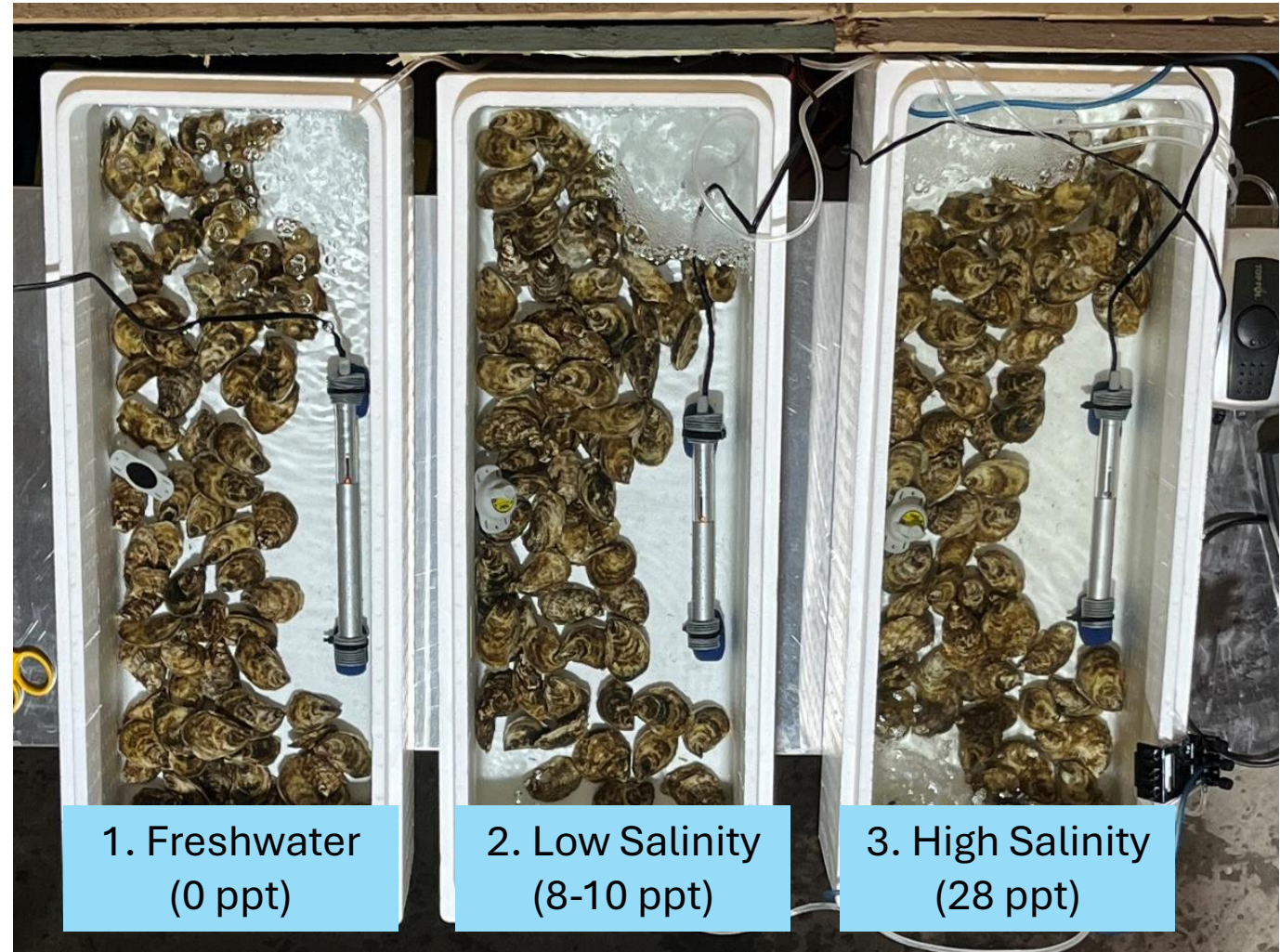
Next Steps - PEI Aquaculture Division

Research and Development

- Collaborative Work
 - eDNA
 - Genome sequencing
 - Hatcheries
 - Nursery equipment
- Division Work
 - Bottom vs. off bottom?
 - Low salinity immersion

Continue Surveillance and Monitoring

- Continue following MSX Trials (Bedecque Bay & Foxley River) monthly through the 2025 field season.
- Oyster Disease Surveillance Program to be repeated in the fall.
- Responding to mortality reports (MSX Info Hub).
- Oyster Monitoring Program (larvae, oyster growth, water quality).





**Fisheries, Tourism,
Sport and Culture**

THANK YOU!

QUESTIONS?

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