



MSX in PEI

Provincial Surveillance & Monitoring Activities

December 11th, 2024

PEI Fisheries, Tourism, Sport & Culture

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Outline

Surveillance Activities

Monitoring for Mortality in Bedeque

Monitoring of “Enhancement” oysters in Bedeque
(and Foxley)

Initiation of trial to compare selectively bred
hatchery oysters to “wild caught”

Next Steps

Surveillance *(provincial samples only)*

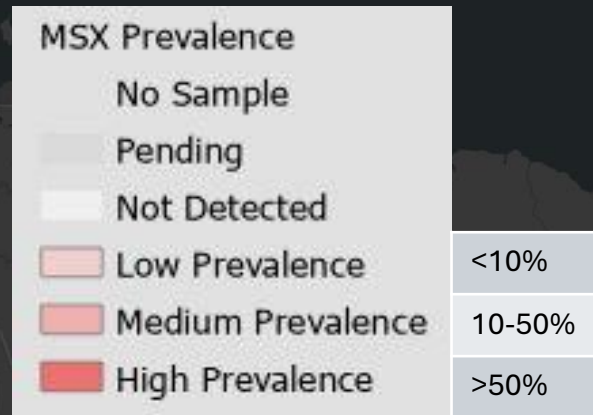
- Status of wild beds for fall fishery
- Response to mortality reports
- Additional information on spread & prevalence



	Samples Collected	Oysters Tested (PCR)
Total	93	3603
Lease	48	1575
Wild Bed	45	2028

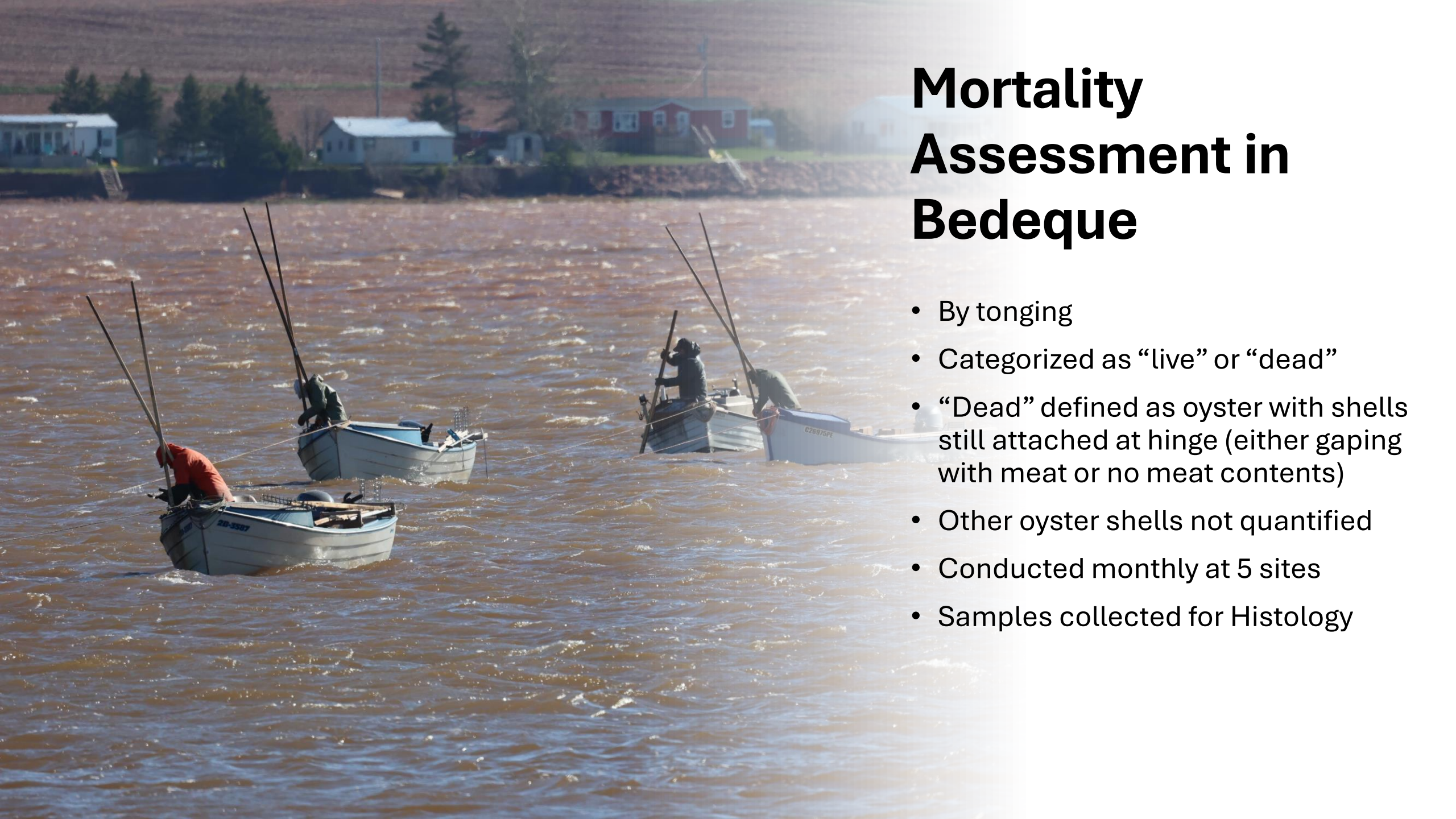
Prevalence Map

(incorporates all known data)



Mortality Assessment in Bedeque

- By tonging
- Categorized as “live” or “dead”
- “Dead” defined as oyster with shells still attached at hinge (either gaping with meat or no meat contents)
- Other oyster shells not quantified
- Conducted monthly at 5 sites
- Samples collected for Histology



Bedeque Bay – Site 1 (The Flats)
November 26, 2024



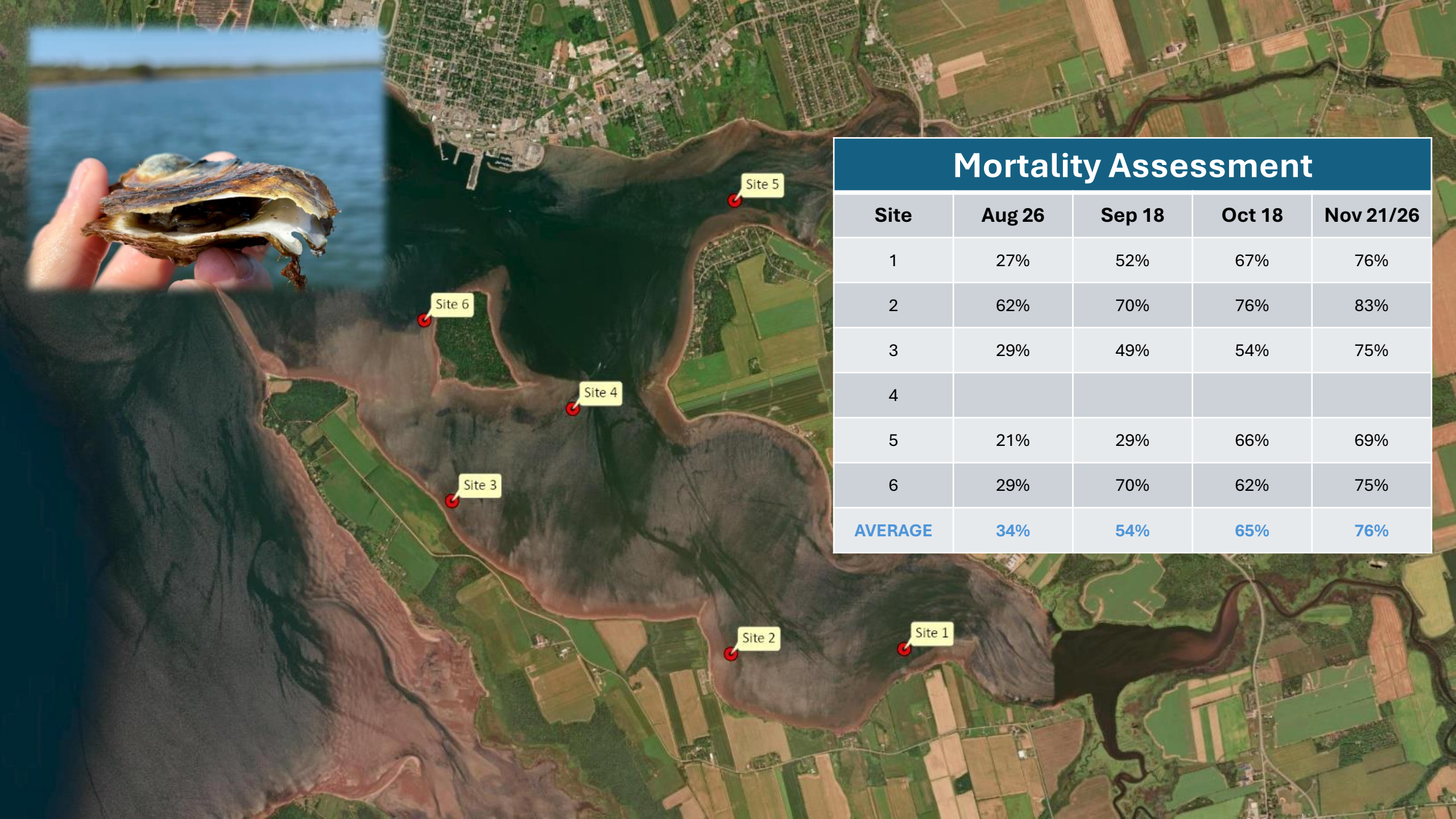
LIVE



DEAD

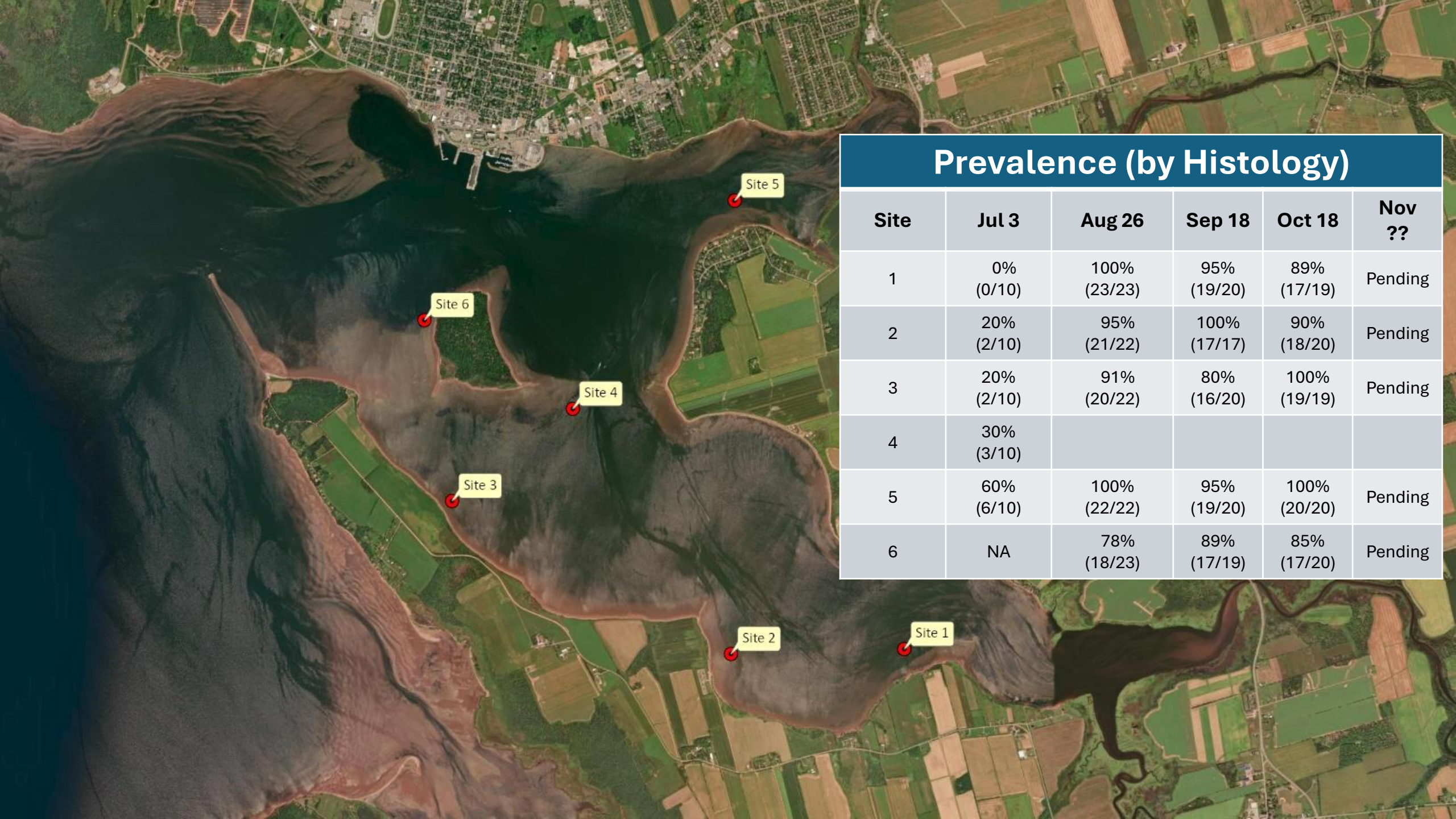
Bedeque Bay





Mortality Assessment

Site	Aug 26	Sep 18	Oct 18	Nov 21/26
1	27%	52%	67%	76%
2	62%	70%	76%	83%
3	29%	49%	54%	75%
4				
5	21%	29%	66%	69%
6	29%	70%	62%	75%
AVERAGE	34%	54%	65%	76%



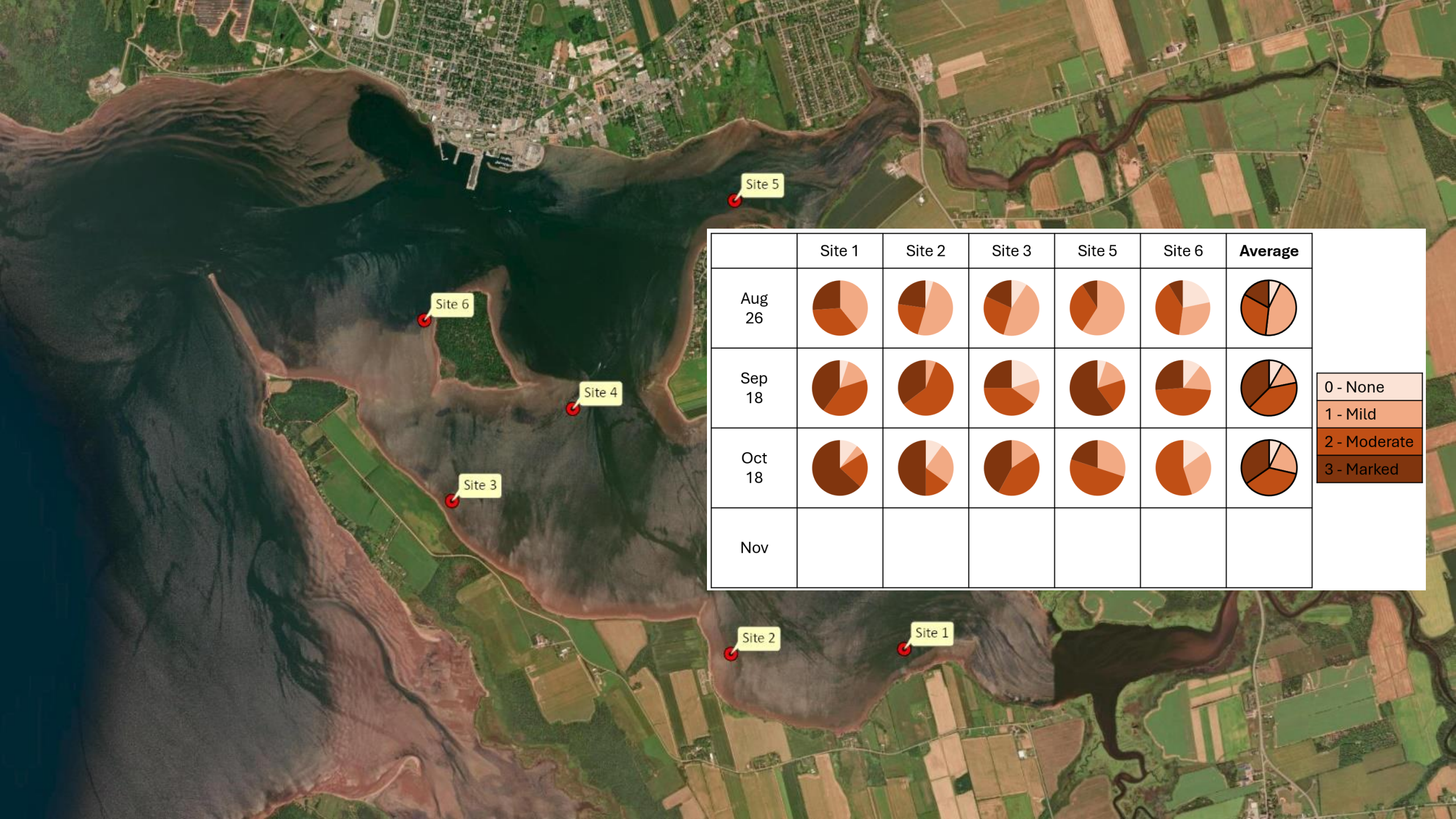
Prevalence (by Histology)					
Site	Jul 3	Aug 26	Sep 18	Oct 18	Nov ??
1	0% (0/10)	100% (23/23)	95% (19/20)	89% (17/19)	Pending
2	20% (2/10)	95% (21/22)	100% (17/17)	90% (18/20)	Pending
3	20% (2/10)	91% (20/22)	80% (16/20)	100% (19/19)	Pending
4	30% (3/10)				
5	60% (6/10)	100% (22/22)	95% (19/20)	100% (20/20)	Pending
6	NA	78% (18/23)	89% (17/19)	85% (17/20)	Pending

Mortality Assessment in Bedeque *Histo Results*

MSX Screening for Bedeque Bay				Infection Severity and Sporulation Grading (none = 0 / mild = 1 / moderate = 2 / marked = 3) Spore formation (Yes / No)										Sum	Other Agents (Present = 1 / Absent = 0)													
Collector Area	Date Collected	Slide	Oyster	AVC U18068		AVC U18069		AVC U18070		AVC U18071		AVC U18072		Sum	Rickettsia-like bacteria					Papilloma-like virus								
				Site -01	Site -02	Site -03	Site -04	Site -05	Site -06	Site -01	Site -02	Site -03	Site -05		Site -06	Site -01	Site -02	Site -03	Site -05	Site -06								
Bedeque Bay	26-Aug-24	A	1	2	N	2	Y	0	N			1	N	2	N			0	0	0	0	0	0	0	0	0	0	
			2	3	Y	3	N	1	N			1	N	3	N			0	0	0	0	0	0	0	0	0	0	
		B	3	3	N	1	N	3	Y			2	Y	1	N			0	0	0	0	0	0	0	0	0	0	0
			4	2	N	2	N	1	N			2	N	2	N			0	0	0	0	0	0	0	0	0	0	0
		C	5	1	N	1	N	0	N			2	N	2	Y			0	0	0	0	0	0	0	0	0	0	0
			6	2	N	1	N	3	Y			1	N	1	N			0	0	0	0	0	0	0	0	0	0	0
		D	7	2	Y	2	N	1	N			1	N	2	N			0	0	0	0	0	0	0	0	0	0	0
			8	1	N	1	N	3	N			1	N	1	N			0	0	0	0	0	0	0	0	0	0	0
		E	9	2	N	1	N	1	N			1	N	1	N			0	0	0	0	0	0	0	0	0	0	0
			10	3	N	1	N	2	N			2	N	1	N			0	0	0	0	0	0	0	0	0	0	0
		F	11	2	Y	3	Y	1	N			1	N	3	N			0	0	0	0	0	0	0	0	0	0	0
			12	1	N	1	N	2	N			3	Y	0	N			0	0	0	0	0	0	0	0	0	0	0
		G	13	1	N	0	N	1	N			1	N	0	N			0	0	0	0	0	0	0	0	0	0	0
			14	1	N	1	N	1	N			1	N	2	Y			0	0	0	0	0	0	0	0	0	0	0
		H	15	3	Y	1	N	1	N			2	N	2	Y			0	0	0	0	0	0	0	0	1	0	0
			16	1	N	3	Y	2	N			1	N	1	N			0	0	0	0	0	0	0	0	0	0	0
		I	17	1	N	3	N	2	N			3	Y	0	N			0	0	0	0	0	0	0	0	0	0	0
			18	2	Y	3	N	2	N			1	N	2	Y			0	0	0	0	0	0	0	0	0	0	0
		J	19	3	Y	1	N	1	N			2	N	0	N			0	0	0	0	0	0	0	0	0	0	0
			20	1	N	2	N	3	Y			2	N	0	N			0	0	0	0	0	0	0	0	0	0	0
		K	21	3	Y	1	N	2	N			1	N	2	Y			0	0	0	0	0	0	0	0	0	0	0
			22	1	N	2	Y	1	N			1	N	1	N			0	0	0	0	0	0	0	0	0	0	0
		L	23	2	Y									2	Y													
Sum of Scores				43	36	34				33	31					0	0	0	1	1			0	0	0	0	1	
Prevalence % of Infection				100	95	95				100	82					0	0	0	5	4			0	0	0	0	4	
Prevalence % of Sporulation					35	18	14				14	26																

Tissues assessed for:
- Infection severity (0-3)
- Spore Formation (Y/N)
- Other agents

Thanks Dr. Groman!



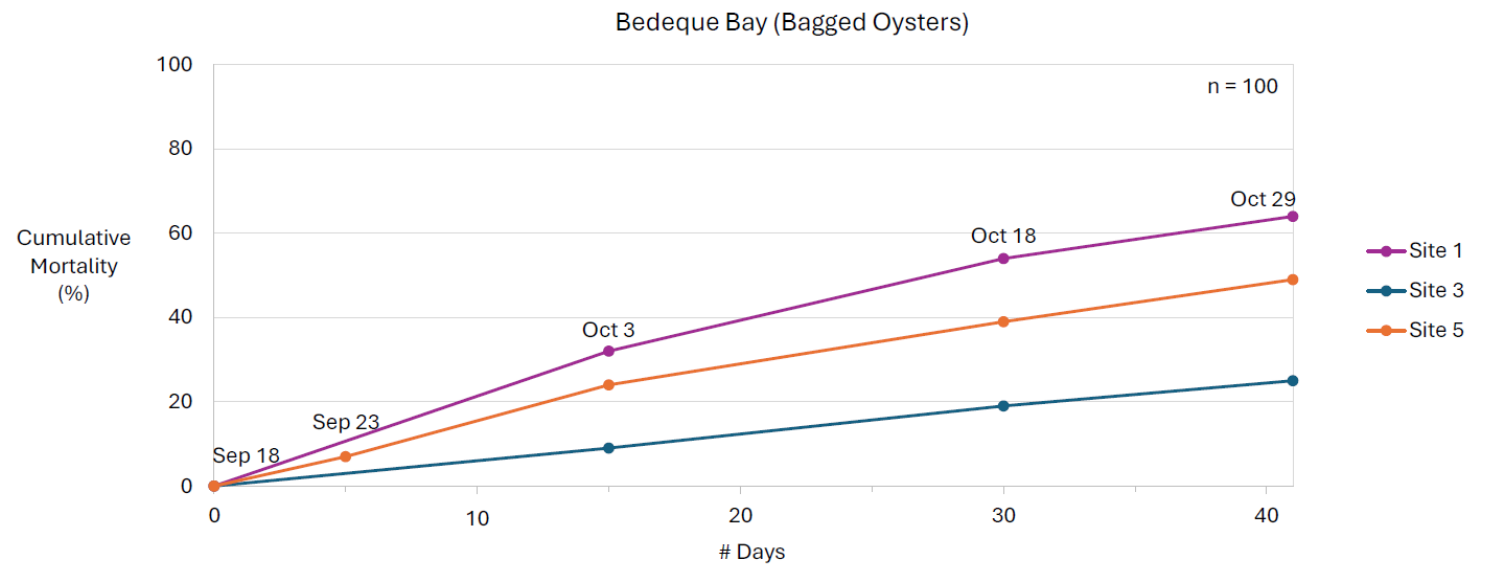
	Site 1	Site 2	Site 3	Site 5	Site 6	Average
Aug 26						
Sep 18						
Oct 18						
Nov						



Improved Method to Assess Mortality?

- Collect 100 “adult” oysters at 3 sites
- Use Vexar bags to hold; anchor bags to bottom
- Mortality assessed every 2 weeks
- Does not capture total mortality, but gives estimate of ongoing mortality
- Initiated on September 18th





Site 1, October 3rd – 15 days after oysters were bagged



Monitoring of “Enhancement” Oysters

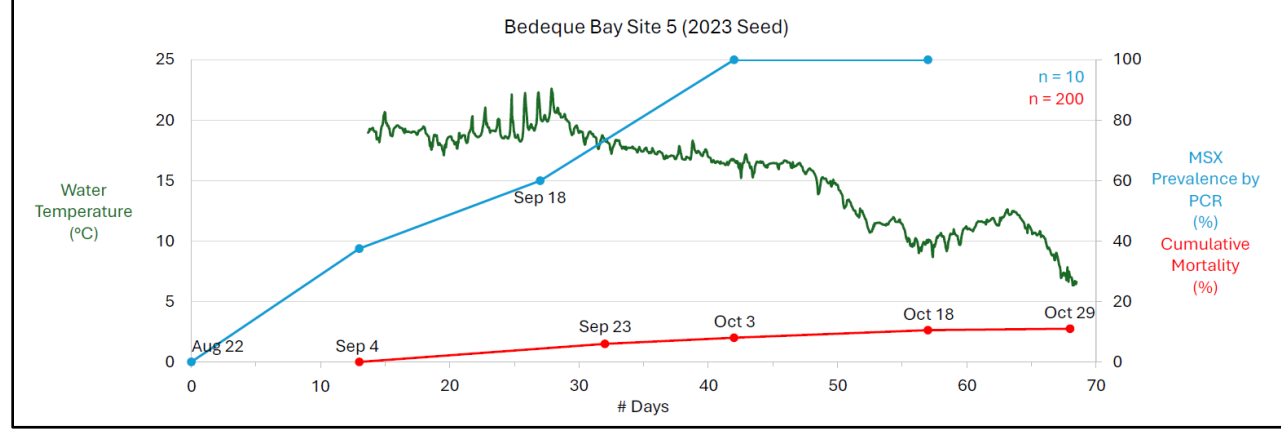
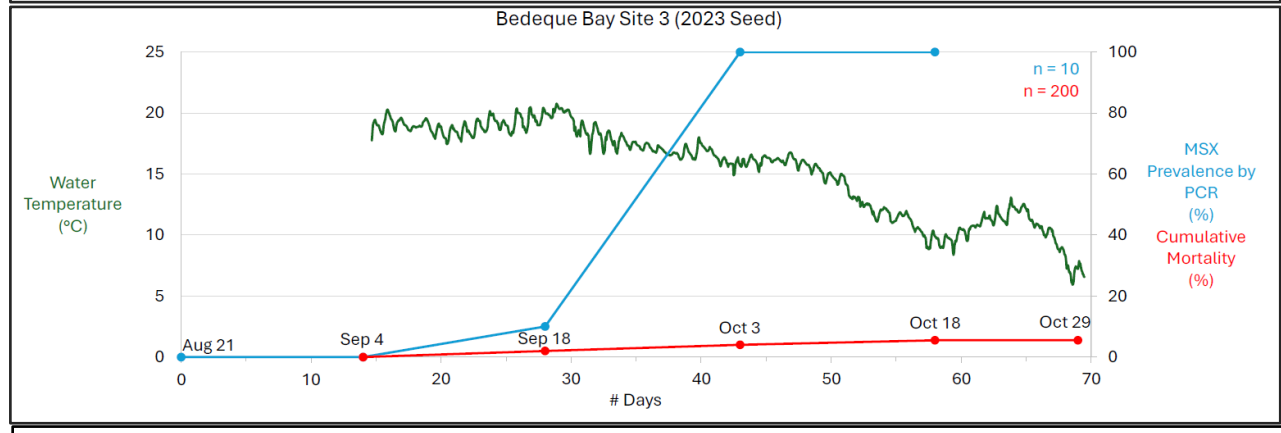
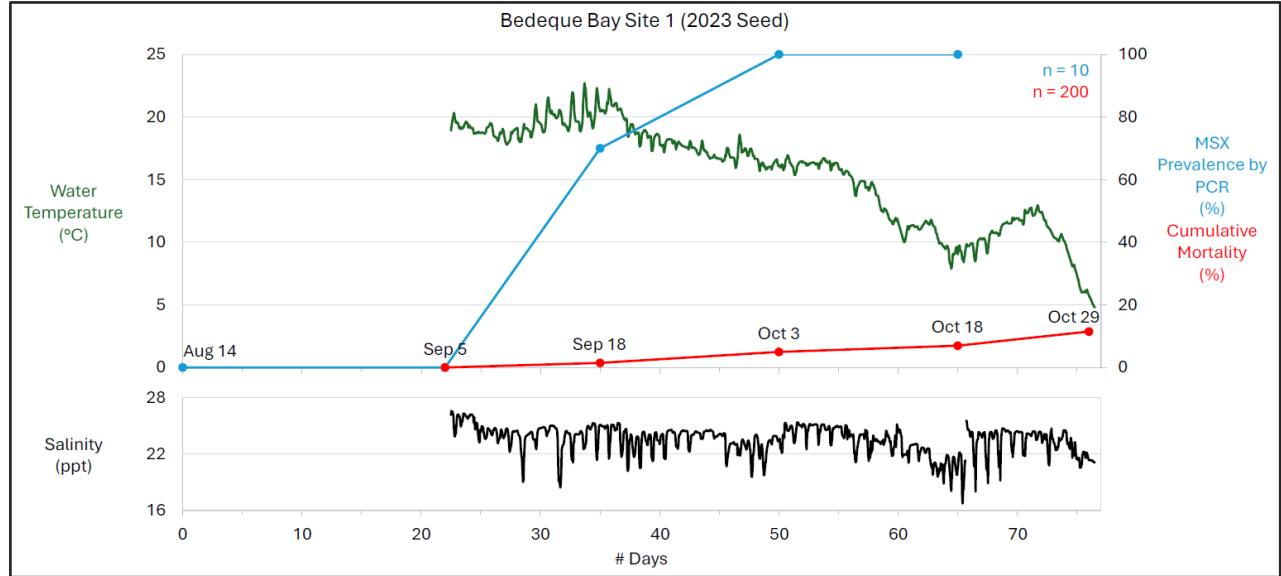
- PEI Shellfish Association collect spat in Bideford River, hold overwinter in bags/cages on leases in Bideford
- Oysters are spread on public beds the following year as an enhancement activity for the commercial fishery
- Some of these oysters (MSX not detected in surveillance samples) were spread in Bedeque and Foxley (with permit)
- Opportunity to monitor oysters (no MSX detected) in an environment with high MSX prevalence

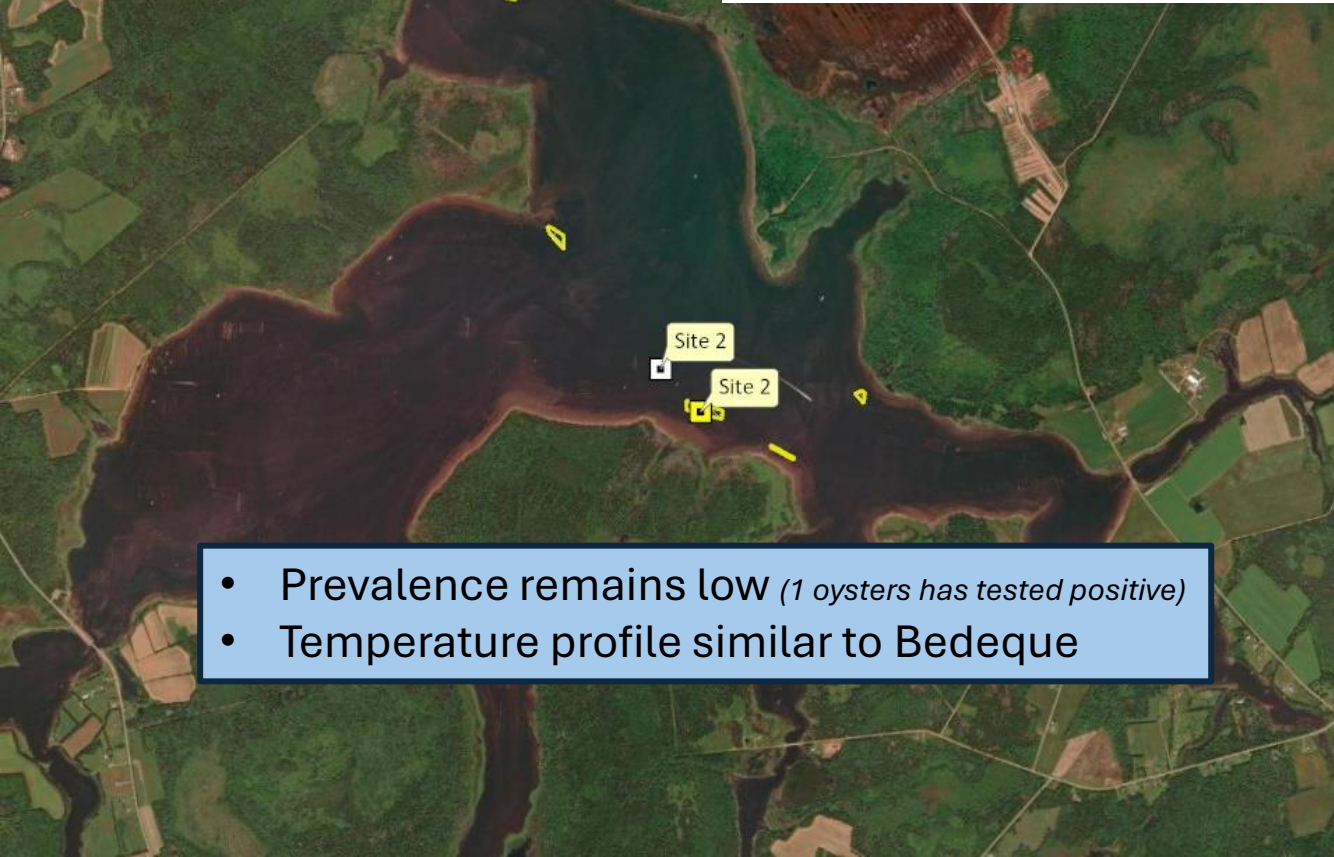
Monitoring of “Enhancement” Oysters

- Objectives
 - Time until infection detected (by PCR...and then histo for severity)
 - Time until mortality observed
 - Impact on growth?
- Location
 - Bedeque (3 sites)
 - Foxley (2 sites)
- Setup at each site
 - 200 oysters in 2 bags (sample collection and mortality monitoring)
 - Temperature/salinity data
- Every 2 weeks
 - Count oysters (live/dead)
 - Collect 10 oysters from each site for testing
 - Measure oysters



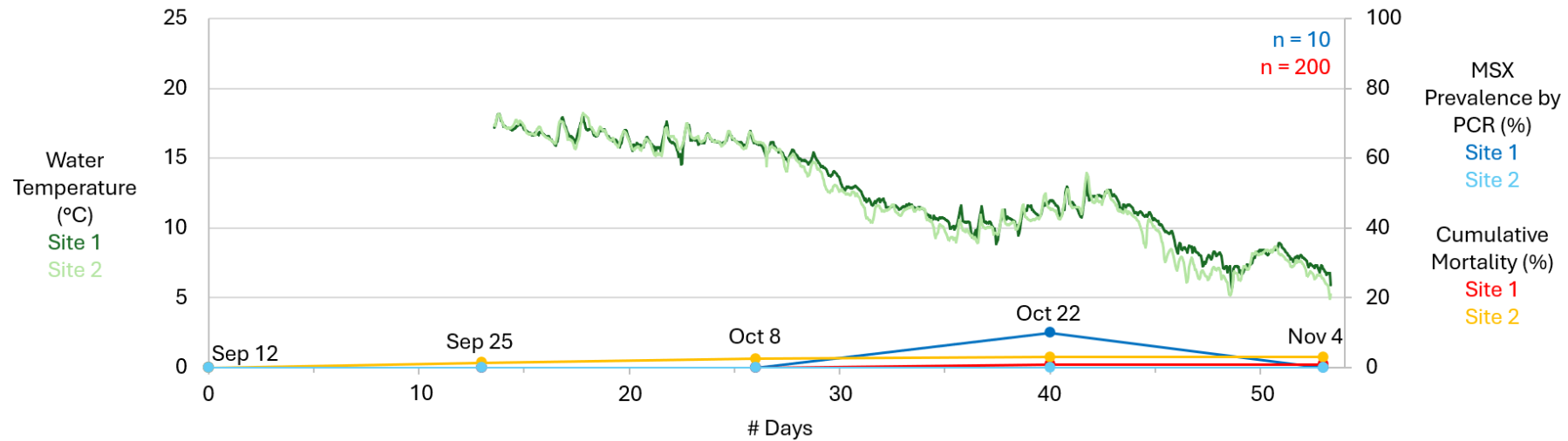
- 100% prevalence after ~40 days
- Salinity ~22 ppt
- Temperature in 5-20°C window for ~50 days in the fall





- Prevalence remains low (*1 oysters has tested positive*)
- Temperature profile similar to Bedeque

Foxley River Sites 1 & 2 (2023 Wild Seed)



Monitoring of Hatchery Seed

- Compare selectively bred (for optimal production, not MSX resistance/tolerance) hatchery seed to wild caught seed
 - 2024 seed (approx. 1")
- Initiated mid October
 - MSX PCR for T0
 - Hatchery 0/50
 - Mill River (PEI Source) 6/49



Next Steps

Continue Established Monitoring

Develop Surveillance Program

- Sample Locations
- Time of Sampling
- Type of Analysis
- Other considerations

MAP!

Additional Salinity Monitoring