PEI Mussel Monitoring Program

2021 Report

Technical Report # 268

By

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ACKNOWLEDGEMENTS

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SUMMARY

The information collected from the Mussel Monitoring Program (MMP) is provided to mussel growers and processors to assist in the management of their mussel farms and mussel harvesting plans. Staff of the Department of Fisheries and Communities (DFC) collected information related to mussel spat-fall, mussel meat yield, water temperature, the presence of potentially toxic algal species, tunicate larvae, and the presence of predators and fouling on mussel seed and grows-out lines. The information was collected from 20 mussel spat collection and growing areas over a period of 32 weeks in 2021.

Information on mussel spat-fall prediction and productivity (meat yield and shell growth) was collected from April 27th to December 2nd and on potentially toxic phytoplankton from September 1st to December 2nd. Monitoring for the presence of potentially toxic phytoplankton was conducted in cooperation with the Canadian Food Inspection Agency (CFIA). The cooperation between CFIA and DFC has increased the program efficiency. Water samples from mussel grow-out areas were examined for the presence of mussel larvae from early May to early December. Growers often delay raising their crop and the socking of new mussel seed in the fall until the mussel spawning period is over and larvae can no longer be detected. This information assists the growers in avoiding a second mussel set on both new and old mussel crop.

Mussel landings in 2021 were 37.5 million lbs., which was an increase of 9.4 million lbs. over the landings in 2020. This increase is most likely related to markets opening after COVID-19 restrictions were eased. The meat yield values of mussels collected from the monitoring stations in 2021 varied greatly (9 – 44 % European meat yield values) from area to area. The variation in meat yield values is a result of the new methodology to measure mussel productivity; high meat yield values of between 19 – 44 % (European meat yield) were reported early in the monitoring season (May) because juvenile mussels (~30 mm) were being used. This contrasts with years prior to 2016, in which mussels greater than 50 mm were used for meat yields. At the end of the monitoring season (November) European meat yields ranged from 11 – 28 % between monitoring sites.

Anecdotal reports from industry indicate that there was a good set of mussel seed in most areas this year. However, staff from the department responded to concerns about the spat set in Baltic River and Hunter River. In general, most of the collectors had a set of spat on the collectors, but

the collectors were impacted by the green algae, *Cladophora sp.* A salt brine solution has been shown to be effective in controlling green algae on mussel collectors.

Temperature data collected at each of the sample sites were within normal ranges for mussel growth and performance. During late July and early August, water temperatures are routinely nearing 25 °C on an annual basis. This is considered an upper threshold for mussel performance and survival and should be closely monitored over the upcoming summer production seasons.

Low counts of *Pseudo-nitzschia sp.* were recorded for most mussel production areas from the water samples collected for the toxic phytoplankton monitoring portion of the program. No toxins were detected in the analysis of mussel tissue. There have been no elevated levels of domoic acid detected in shellfish since the fall of 2006 and, as a result, there were no closures of mussel harvesting areas due to presence of toxins.

Tunicates continue to cause fouling problems for many mussel growers, with high densities of vase tunicates occurring in Montague River, Brudenell River, St. Mary's Bay, Murray River, Boughton River and Cardigan River. Vase tunicates were found in Borden by department staff on November 9th, 2021. In the previous two years, the vase tunicate had only been observed on collector plates in Borden, deployed by Fisheries and Oceans Canada staff. Industry reported the possible presence of the vase tunicate in South Lake in December 2019; however, the presence of the tunicate species has yet to be been confirmed despite several surveys being conducted. In 2020, the vase tunicate was detected by industry members in Southwest River and St. Peter's Bay. Department staff continue to monitor for the presence of this species in these two areas. The density of the clubbed tunicate remains high in the Lennox Channel and March Water portions of Malpeque Bay and in Darnley Basin. In addition, mussel farmers in Rustico Bay suggest that clubbed tunicate density is on the rise in that bay. Both the clubbed and vase tunicates are being managed through treatment activities. For information on the locations of the vase tunicate and the clubbed tunicate in PEI, see the invasive species locator maps in Appendix V.

Tunicate larvae numbers, listed by species, are shown in Appendix I. Vase tunicate larvae were present in water samples from May 26th until November 8th. The peak vase tunicate larval count was observed in water samples collected from Boughton River on September 7th, with 93 larvae being counted in a 150 L water sample. Clubbed tunicate larvae were present in water samples

collected in Malpeque Bay (Lennox Channel, March Water and Darnley Basin) from June 16th until September 15th, peaking in Lennox Channel on June 30th with 38 larvae detected.

Information collected over the 2021 season was communicated to mussel growers via the use of the Mussel Monitoring website at https://www.princeedwardisland.ca/en/feature/view-mussel-monitoring-results. The website was updated in 2021.

INTRODUCTION

The Prince Edward Island Mussel Monitoring Program (MMP) is a technical service provided to cultured mussel growers and processors by the Department of Fisheries and Communities (DFC). The MMP has operated annually since 1982 during the ice-free season providing mussel growers and processors with a variety of information to assist them in the management of their operations (Figure 1).

Figure 1. Mussel farm operations in the March Water area of Malpeque Bay.

Information is collected for the MMP on mussel spat-fall prediction, mussel meat yield analysis, water temperature, the detection and estimation of the numbers of potentially toxic algae species (such as the toxin producing diatom, *Pseudo-nitzschia sp.*, and dinoflagellates, *Alexandrium sp.* and *Dinophysis sp.*), the presence and number of tunicate larvae, and the presence and quantity of predators and fouling organisms.

The department has expanded the role of the MMP over time in response to requests for additional information by the mussel industry. As well, the information collected for this program is often utilized by other government and academic research agencies and additional information has been collected for researchers when possible. The MMP has provided this assistance without substantially re-directing its resources from its mandate as a technical advisory service to the Prince Edward Island (PEI) mussel growers.

In 2021, the cultured mussel industry produced 37.5 million lbs. of product for market with a landed value of $30 million; a significant increase in both landings (9.4 million lbs.) and value ($10.3 million), as compared to 2020 (Figure 2). This increase is most likely related to markets opening after COVID-19 restrictions were eased. The mussel industry is an important contributor to the PEI economy and has resulted in the creation of an estimated 1,500 full-time jobs and numerous spin-off industries. The economic value of the industry to PEI is estimated at over $60 million dollars.

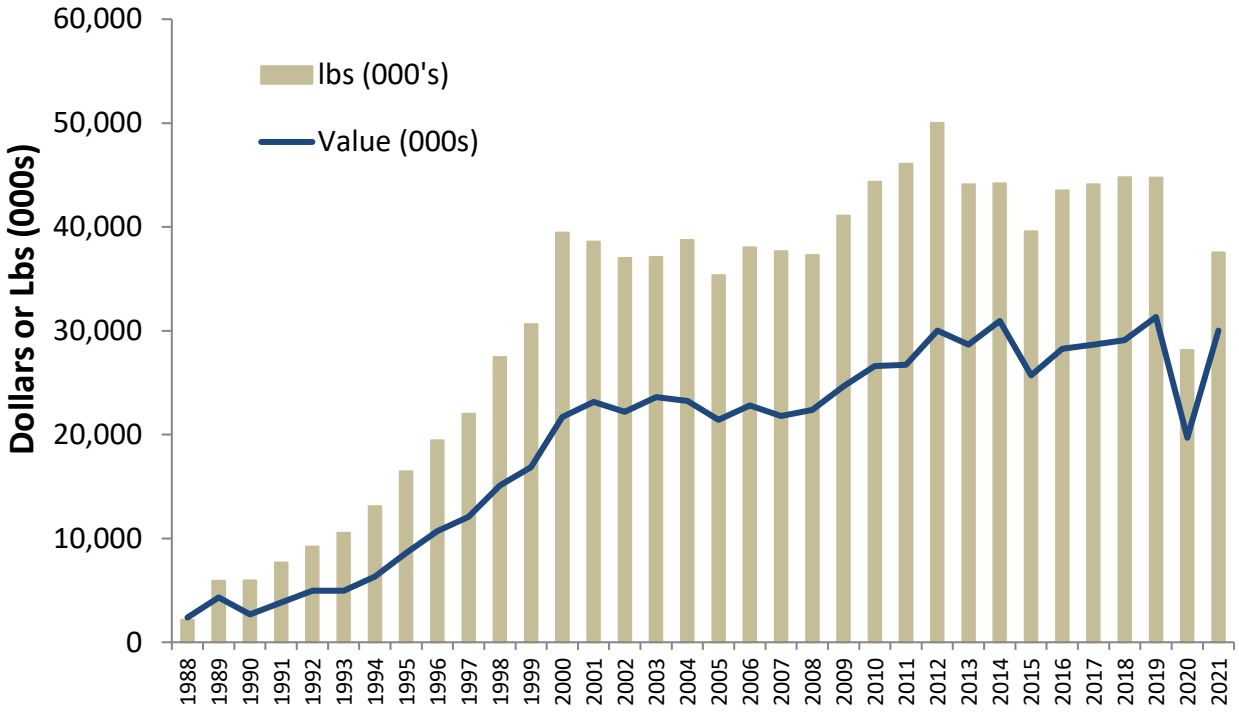


Figure 2. PEI mussel landings and values from 1988 to 2021.

The mussels grown in PEI waters are of high quality because the growing areas are abundant in food and have excellent water exchange. The rivers and bays on PEI are well sheltered from prevailing winds making them ideal for mussel aquaculture.

The objective of this report is to document the information that was communicated to mussel growers during the 2021 season through the MMP website. Early in 2021 the MMP website was updated https://www.princeedwardisland.ca/en/feature/view-mussel-monitoring-results.

MATERIALS AND METHODS

EQUIPMENT

- 17' Boston Whaler, 90 hp Yamaha outboard motor and Shorelander boat trailer
- YSI temperature meter, HOBO automated temperature recorders, water pump (50L/minute capacity), 64 micron nitex screen for collecting mussel larvae, 20' clear plastic tubing (1.5" in diameter) and 2.5 gallon container
- Electronic weigh scale, calipers and cooking equipment for meat yield analysis
- Microscope, slides and pipettes for mussel larvae and phytoplankton observation
- Vacuum pump and filtering apparatus for phytoplankton slide preparation
- Field books, sample bags and cooler
- Computer and printer to analyze and store data

METHODS AND PROCEDURES

The data collected by the MMP is to provide information on six main areas related to mussel aquaculture:

1. Mussel spat-fall prediction
2. Mussel meat yield
3. Water temperature
4. Presence of potentially toxic phytoplankton
5. Tunicate larvae sampling
6. Predators and fouling organisms

Twenty mussel growing/spat collection areas are sampled weekly for the MMP (Figure 3). Maps of the specific locations of each of the sample sites are displayed in Appendix II.

Figure 3. Sample collection sites for the Mussel Monitoring Program.

1. SPAT-FALL PREDICTION

The numbers and size range of mussel larvae were determined from water samples collected weekly at each of the sample locations from early May until mid July. This information was used to assist mussel growers in predicting the timing and abundance of mussel spat-fall. The growers use this information to determine when to either deploy, or to raise and clean their collectors in order to maximize spat collection. Mussel larvae information was also collected from July to late November at some grow-out sites to provide growers with information on mussel "second set". Some growers attempt to avoid or reduce the amount of second set from settling on market mussels by keeping the mussels submerged until mussel larvae are no longer detected in the water column. The growers also avoid the second set from settling on newly socked mussels by delaying the socking process until after the second set is complete.

To collect mussel larvae for this analysis, water samples are pumped from the top two to three meters of the water column through a 64 µm screen at the rate of 50 liters per minute for three minutes (Figure 4). The mussel larvae become trapped on the screen surface and are washed off with 10 mL of previously screened seawater into a sample bottle. A 1 mL subsample of the larval concentrate is examined utilizing a compound microscope to determine the abundance and average size of the mussel larvae. The quantity of mussel larvae present is quantified according to the following scale: Low = 1 – 5 Medium = 6 – 15 High = >15

Figure 4. Staff collecting "pump sample" (left) and water quality data (right).

2. MUSSEL MEAT YIELD

Mussel socks with juvenile mussels (spat from previous fall, ~30mm in length) are collected at the beginning of the season in May and placed in wire cages at each monitoring station for meat yield analysis. In most cases, the monitoring cage was positioned near the mussel lease that is closest to the mouth of the bay or river and sits approximately 2 metres down from the surface of the water. The collection site of the mussel socks is recorded in the event that the monitoring cages need to be restocked; the same stock is used throughout the monitoring season to monitor productivity (meat yields and shell growth). The same stock of mussels (2020 spat collection) is monitored for meat yield and shell growth through the monitoring season. Samples for meat yield analysis and shell growth were collected from each of the monitoring stations from early May to early December. The following procedure is used for the determination of mussel meat yields:

A. Thirty mussels are randomly selected and cleaned in fresh running water.

B. Mussels are steamed in the absence of water for five minutes, and then the meats are shucked from the shells.

C. The steamed meat yield, expressed as a percentage, is determined according to the formula: $$\% \text{ Meat Yield} = \frac{\text{Steamed Meat Weight}}{(\text{Steamed Shell} + \text{Steamed Meat Weight})} \times 100$$

D. The European meat yield, expressed as a percentage, is determined according to the formula: $$\% \text{ European Meat Yield} = \frac{\text{Steamed Meat Weight}}{\text{Raw Weight of Sample}} \times 100$$

Mussel meat yield information is beneficial to growers to assist in the determination of the mussel spawning condition in a river system. The information, when collected over a long-term basis, is of interest in the analysis of potential trends in mussel condition and productivity. This information is displayed graphically in Appendix IV.

3. WATER TEMPERATURE

Water temperatures were recorded from 1 to 2 metres below the surface at each site, at the time of each site visit, throughout the season. In addition, automatic temperature recording devices, set to record hourly temperature readings, were placed approximately 2 metres below the surface

(attached to the monitoring cage) in several of the mussel growing areas. The hourly collected temperature data provided additional information on water temperature profiles throughout the ice-free season. This information assists growers in comparing temperature conditions with the development of mussel spawning condition over the season in various river systems. As well, in the event that shellfish mortality occurs, it is beneficial to have the information on temperatures over the season to assist in the investigation of the cause of the mortality. Temperature profiles taken from each of the mussel monitoring stations can be found in Appendix III and in Appendix I for specific sampling days.

4. PHYTOPLANKTON MONITORING

The monitoring for the presence of potentially toxic phytoplankton began on September 1st and continued until December 2nd in 2021. It is during this time period that toxic algae blooms have most frequently occurred in PEI waters. This portion of the program was conducted in conjunction with the Canadian Food Inspection Agency (CFIA) who shares in the collection of samples with staff of the MMP. The procedure utilized to collect (see Figure 5), identify and quantify potentially toxic algae is documented in the DFO procedures manual "*A field and laboratory manual for the collection, identification and enumeration of toxic marine phytoplankton*" by John C. Smith and Kevin Pauley.

Figure 5. Staff using "tube sampler" to collect water sample for phytoplankton analysis.

Department staff collected water samples weekly from sites in Boughton River, Brudenell River, Cardigan River, Covehead Bay, Murray River, Nine Mile Creek, Orwell Bay, Savage Harbour, St. Mary's Bay, St. Peter's Bay and Tracadie Bay. Mussel samples were also collected by department staff from these sites for the CFIA toxin monitoring program. CFIA staff collected water and mussel samples from Darnley Basin, Lennox Channel, March Water, New London Bay, and Rustico Bay for both programs.

Information on the identification and quantity of potentially toxic phytoplankton species observed in the water samples were reported to CFIA and also were made available to growers on the MMP website. The numbers of algal cells observed were reported according to the following scale: Trace = 1 - 1000 cells/L; Low = 1000 - 50,000 cells/L; Medium = 50,000 - 350,000 cells/L; High = greater than 350,000 cells /L.

The results of the phytoplankton analysis for 2021 are reported in the results section of this report (Appendix I). The information collected from this portion of the program is beneficial to provide both industry and CFIA with an early warning of the possibility of a bloom of potentially toxic algae occurring in an area. The presence of toxins in mussel tissue is monitored by CFIA, and closures are based upon these levels; however, the information on the types and quantity of phytoplankton present in the water column is invaluable as early warning that an event might occur. If the samples show that numbers of a potentially toxic algae species are present and increasing in a river system CFIA may increase their sampling of mussels from the area and industry can plan future mussel harvests avoiding the algae bloom and ensuring that a safe product is sold to the market place.

5. TUNICATE LARVAE

The numbers of tunicate larvae were counted in water samples collected from tunicate infested areas (see Appendix I for numbers of tunicate larvae). The purpose of obtaining the larvae numbers was to: inform growers when the tunicates start and stop spawning, the species of tunicate larvae present, and to provide an indication of the amount of larvae that were present over the season. Research results have shown that there may not be a direct correlation between the timing and density of tunicate recruitment and the observation of tunicate larvae and larvae densities in the water samples collected for MMP. However, the mussel industry has requested that this information be collected by the program. The information may show changing trends in

tunicate populations over time. Tunicate counts were conducted weekly from mid May to late November. Water samples were collected by pumping water through a 64 µm sieve using a water pump at the rate of 50 L per minute for 3 minutes (a total of 150 L per sample). Tunicate larvae were identified and counted in the entire water sample (Figure 6). The larvae counts were made available for the growers on the MMP website.

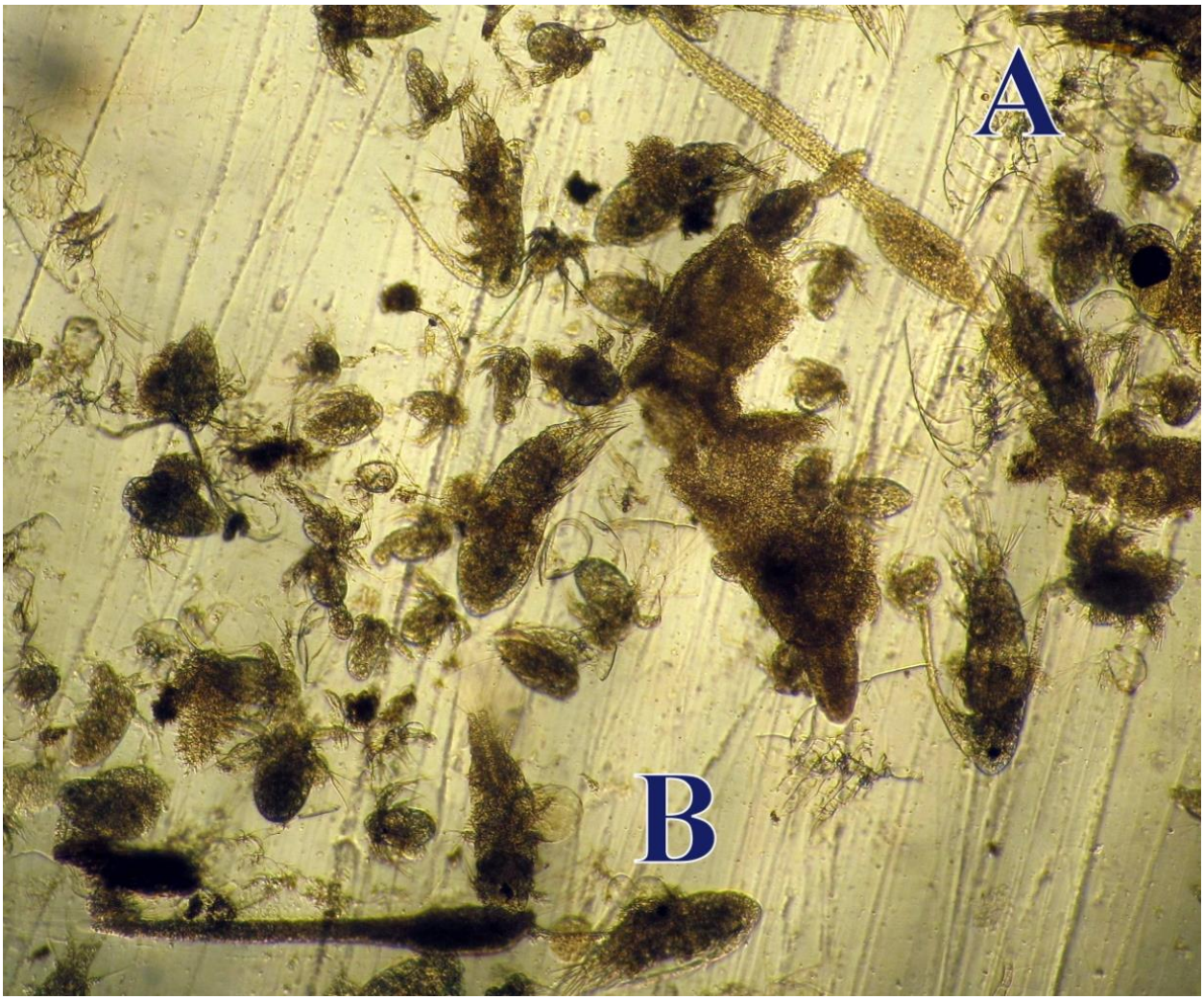


Figure 6. *Ciona intestinalis* (A) and *Styela clava* (B) larvae viewed with microscope.

6. PREDATOR AND FOULING MONITORING

Spat lines were examined for the general appearance of the crop and for the presence of predators (such as starfish and sea ducks), fouling organisms such as algae, hydroids, tunicates or sea anemones and for the presence of silt. Mussel growers are notified of any potential problems that are noted by technical staff. If growers observe any unusual fouling organisms or aquatic

invasive species that are outside of their known range, they are asked to either contact this department or Fisheries and Oceans Canada (DFO). Staff of either department will be available to identify the organisms and provide more information on the species. Information and maps showing the current known ranges of all aquatic invasive tunicates in PEI waters is available on the MMP website, in Appendix V of this report, or may be obtained by contacting staff of either our department or DFO.

REPORTING

The information collected from the MMP is made available throughout the field season through the mussel monitoring website. Mussel growers can access this information at any time. The web address is https://www.princeedwardisland.ca/en/feature/view-mussel-monitoring-results. Figures 7a, 7b and 7c show the new format of the website.

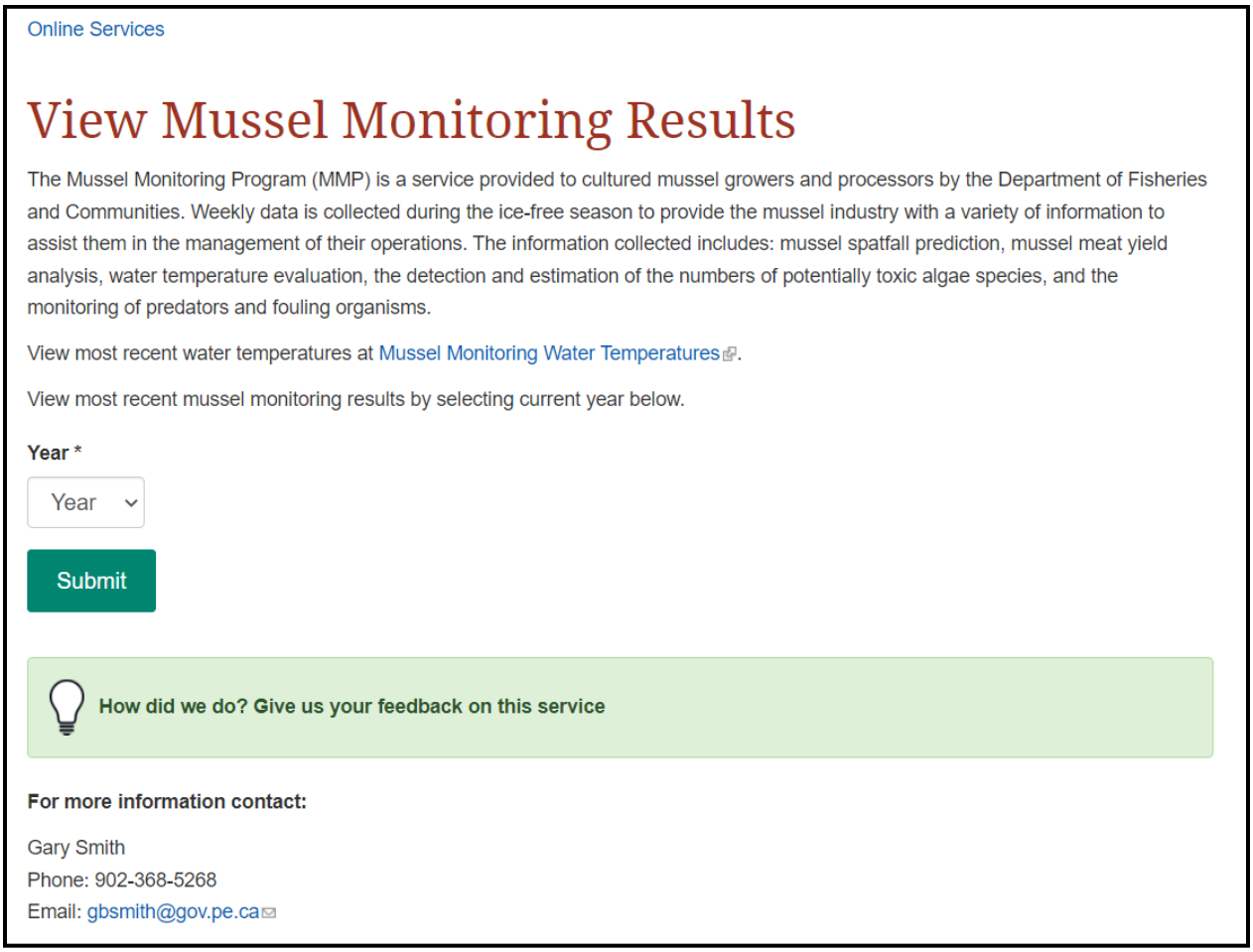
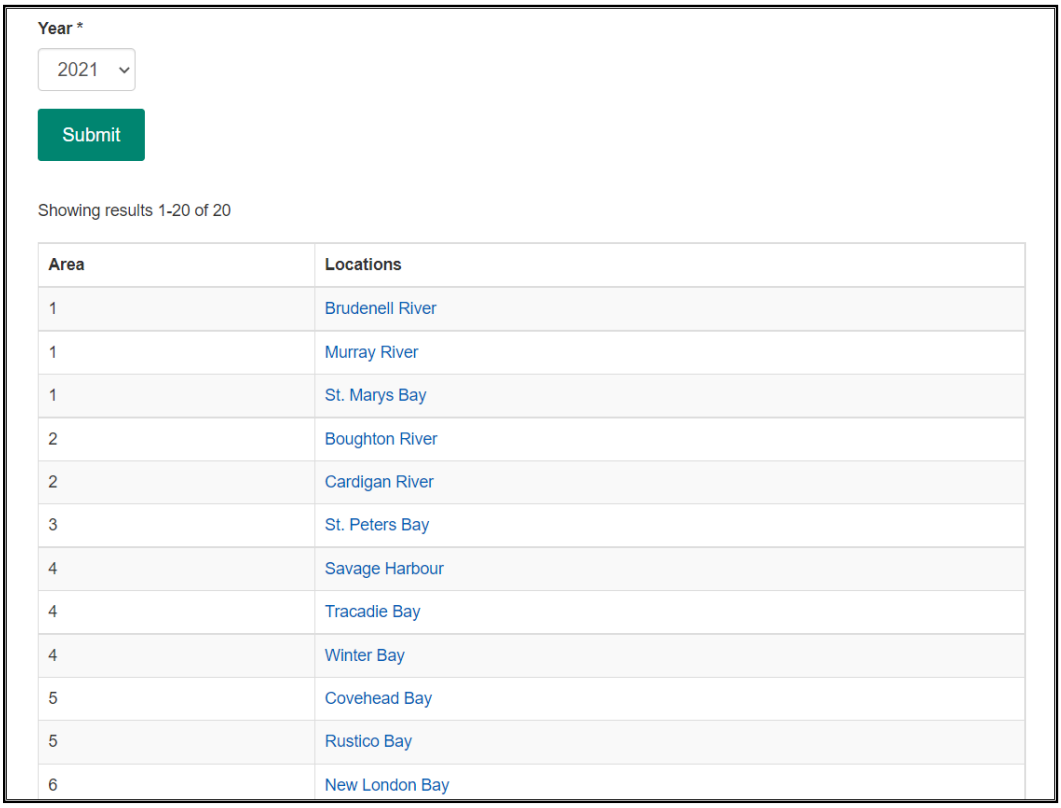


Figure 7a. MMP results webpage; dropdown menu for year of interest.



Year *

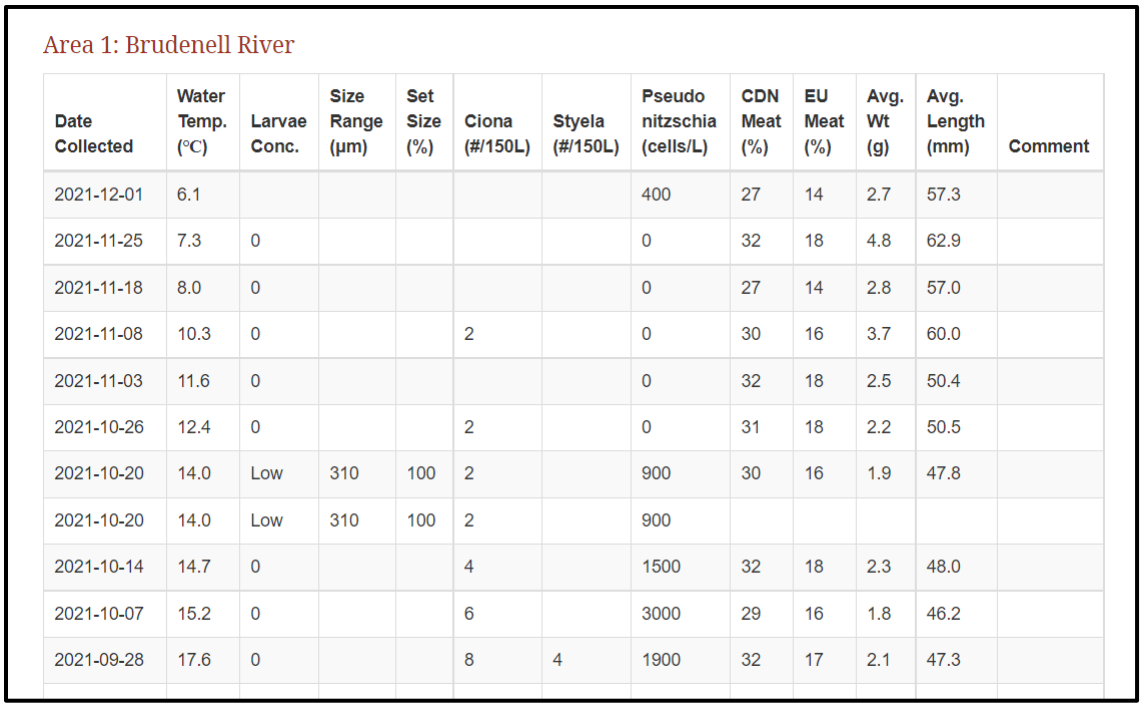
2021

Submit

Showing results 1-20 of 20

Area	Locations
1	Brudenell River
1	Murray River
1	St. Marys Bay
2	Boughton River
2	Cardigan River
3	St. Peters Bay
4	Savage Harbour
4	Tracadie Bay
4	Winter Bay
5	Covehead Bay
5	Rustico Bay
6	New London Bay

Figure 7b. MMP results webpage; list of monitoring sites for selection.



Area 1: Brudenell River

Date Collected	Water Temp. (°C)	Larvae Conc.	Size Range (µm)	Set Size (%)	Ciona (#/150L)	Styela (#/150L)	Pseudo nitzschia (cells/L)	CDN Meat (%)	EU Meat (%)	Avg. Wt (g)	Avg. Length (mm)	Comment
2021-12-01	6.1						400	27	14	2.7	57.3	
2021-11-25	7.3	0					0	32	18	4.8	62.9	
2021-11-18	8.0	0					0	27	14	2.8	57.0	
2021-11-08	10.3	0			2		0	30	16	3.7	60.0	
2021-11-03	11.6	0					0	32	18	2.5	50.4	
2021-10-26	12.4	0			2		0	31	18	2.2	50.5	
2021-10-20	14.0	Low	310	100	2		900	30	16	1.9	47.8	
2021-10-20	14.0	Low	310	100	2		900					
2021-10-14	14.7	0			4		1500	32	18	2.3	48.0	
2021-10-07	15.2	0			6		3000	29	16	1.8	46.2	
2021-09-28	17.6	0			8	4	1900	32	17	2.1	47.3	

Figure 7c. MMP results webpage; as example, results for Brudenell River.

RESULTS AND DISCUSSION

Information collected on quantity and size ranges of mussel larvae, meat yields, water temperature, numbers of potentially toxic algae and tunicate larvae from each monitoring location are presented in the tables in Appendix I.

High numbers of setting size mussel larvae were observed in water samples at most locations from mid June until early July. Anecdotal reports from industry indicate that there was a good set of mussel seed in most areas in 2021. However, staff from the department responded to concerns about the spat set in Baltic River and Hunter River. In general, most of the collectors had a set of spat on the collectors, but the collectors were impacted by the green algae, *Cladophora sp.* A salt brine solution has been shown to be effective in controlling green algae on mussel collectors.

In 2021, low numbers (less than 50,000 cells/L) of *Pseudo-nitzschia sp.* cells were observed at most locations. The highest number of cells/L were observed in New London Bay on September 13th (60,800 cells/L) and 20th (58,300 cells/L). In past years, there were frequent fall blooms of *Pseudo-nitzschia sp.*, which provided a significant food source for cultured mussels prior to the winter period. However, there have been no closures to mussel harvesting due to domoic acid toxicity since 2006. For example, in Cardigan River the numbers of *Pseudo-nitzschia sp.*, (a non-toxin producing form), peaked in the late fall of 2001 at 5.6 million cells/L of seawater and in 2002 at 9.3 million cells/L. In 2013, the peak numbers of *Pseudo-nitzschia sp.* cells was 3.2 million cells/L (Lennox Channel).

Tunicates continue to cause fouling problems for many mussel growers, with high densities of vase tunicates occurring in Montague River, Brudenell River, St. Mary's Bay, Murray River, Boughton River and Cardigan River. In the Borden area, vase tunicates were detected on collector plates, deployed by Fisheries and Oceans Canada, in 2019 and 2020. Department staff followed-up and searched the area (primarily the wharf structure) in both 2019 and 2020; however, no vase tunicates were found. On November 9th, 2021, department staff searched the area again for the vase tunicate. One vase tunicate was found on the wharf structure and several larger tunicates (including one clubbed tunicate) were found in a green mesh bag tied to the wharf (Figure 8).

Figure 8. Vase tunicate found on wharf structure (*top*) and in green mesh bag (*bottom*).

Industry reported the possible presence of the vase tunicate in South Lake in December 2019; however, the presence of the tunicate species has not been confirmed despite several surveys being conducted. Industry reported the presence of the vase tunicate on their gear in Southwest River on July 29th, 2020. Staff from the Aquaculture Division confirmed that it was the vase tunicate later that same day. Staff have not found the vase tunicate in the area in follow-up surveys conducted on July 30th and October 2nd, 2020 and August 27th, 2021. Additionally, industry members in the area have not observed the organism since the original finding. Additional surveys of the area will be completed in 2022. Industry also reported the presence of the vase tunicate on their crop in St. Peter's Bay on August 10th, 2020. Staff confirmed the

presence of the vase tunicate on mussel crop on August 11th, 2020. In addition, staff observed low numbers of the vase tunicate during a dive survey on September 29th, 2020. The vase tunicate is now considered established in St. Peter's Bay. Staff conducted follow-up surveys on May 7th and August 30th, 2021 to monitor the abundance in the bay. The vase tunicate was observed on a variety of structure, including mussel socks, buoys and oyster trays (Figure 9).

Figure 9. Vase tunicates observed on mussel socks and buoys in St. Peter's Bay on May 7th, 2021.

On October 19th, 2021 DFO Science notified the department that a vase tunicate had been identified on their collectors in the Alberton Harbour area. Staff surveyed the floating docks near the slip on October 20th and identified several vase tunicates. A survey of the area surrounding Alberton Harbour was completed the following day, October 21st. Many vase tunicates were identified on the floating docks (Figure 10) within the harbour area; however, no vase tunicates were identified outside of the harbour area. During the search of the area surrounding Alberton Harbour, several clubbed tunicates were identified in the area (including Alberton Harbour, Dock River and Mill River). An additional survey of the area will be completed in 2022.

Figure 10. Vase tunicates identified unded the floating docks in Alberton Harbour on October 21st, 2021.

The density of the clubbed tunicate remains high in the Lennox Channel and March Water portions of Malpeque Bay and in Darnley Basin. In addition, anecdotal reports from mussel farmers in Rustico Bay suggest that clubbed tunicate density is on the rise in that bay. Both the clubbed and vase tunicates are being managed through treatment activities. For information on the locations of the vase tunicate and the clubbed tunicate in PEI, see the invasive species locator maps in Appendix V.

Tunicate larvae numbers, listed by species, are shown in Appendix I. Vase tunicate larvae were present in water samples from May 26th until November 8th. The peak vase tunicate larval count was observed in water samples collected from Boughton River on September 7th, with 93 larvae being counted in a 150 L water sample. Clubbed tunicate larvae were present in water samples collected in Malpeque Bay (Lennox Channel, March Water and Darnley Basin) from June 16th until September 15th, peaking in Lennox Channel on June 30th with 38 larvae detected.

The department continues to be involved in a project to gather more water quality information in several mussel producing areas. Water quality meters are collecting information on water temperature, salinity, dissolved oxygen, chlorophyll (indicator of phytoplankton), fDOM (indicator of other organic material that could be a food source), pH and turbidity. This will give a baseline to compare to future years, possibly enabling the prediction of shellfish growth rates.

On a longer term basis, this information could be used to determine best bay management practices to optimize growth/production within a bay/river. Ultimately, that is the end goal in the collection of this data, but it will take more time to determine trends within growing areas. This is especially important with the issue of climate change, as our weather patterns become more unpredictable.

The mussel industry has grown significantly from its small beginnings in the 1980s. Throughout the development of the industry there have been numerous challenges to overcome. It has been almost two decades since the vase tunicate was first detected in PEI. The introduction of this species has had a significant impact on the mussel industry, especially in the eastern growing areas. Through perseverance, hard work and ingenuity, the mussel industry in eastern PEI is still able to produce a high-yield crop, relatively free of tunicate fouling (Figure 11).

Figure 11. Mussel crop in the Lower Montague area on October 25th, 2021.

APPENDIX I MUSSEL MONITORING DATA BY AREA

Bentick Cove									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
Jun 03	15.2	Low	90 – 120	100	0	- - - -	- - - -	- - - -	- - - -
Jun 08	20.3	Med	90 – 160	100	0	- - - -	- - - -	- - - -	- - - -
Jun 15	18.0	High	90 – 260	98	2	- - - -	- - - -	- - - -	- - - -
Jun 22	21.9	High	90 – 290	90	10	- - - -	- - - -	- - - -	- - - -
The setting of mussel larvae occurs when they reach a size of at least 250 microns. Setting started in this area approximately June 15, 2021.									

Boughton River									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
May 04	6.2	0	- - - -	0	0	59	40	- - - -	0
May 11	6.7	0	- - - -	0	0	57	39	- - - -	0
May 18	9.6	0	- - - -	0	0	56	38	- - - -	0
May 26	9.2	0	- - - -	0	0	45	27	- - - -	0
Jun 01	10.9	0	- - - -	0	0	44	26	- - - -	0
Jun 08	16.5	Low	90 – 150	100	0	39	20	- - - -	13C
Jun 15	14.3	High	90 – 240	100	0	42	21	- - - -	32C
Jun 22	17.3	High	90 – 290	95	5	41	20	- - - -	12C
Jun 29	15.5	High	90 – 310	90	10	42	21	- - - -	6C
Jul 05	15.6	High	90 – 330	85	15	40	21	- - - -	18C
Jul 14	18.1	Med	90 – 400	60	40	29	14	- - - -	28C
Jul 20	18.9	Med	110 – 390	50	50	30	14	- - - -	11C
Jul 26	19.3	- - - -	- - - -	- - - -	- - - -	27	12	- - - -	2C
Aug 03	18.8	- - - -	- - - -	- - - -	- - - -	26	12	- - - -	20C
Aug 11	20.4	Low	120 – 340	50	50	27	12	- - - -	7C
Aug 19	21.8	Med	110 – 330	10	90	26	12	- - - -	12C
Aug 26	22.4	Low	120 – 360	50	50	23	11	- - - -	2C
Sep 01	21.4	Low	280 – 320	0	100	23	12	0	20C
Sep 07	18.4	Low	190 – 380	50	50	27	11	6,900	93C
Sep 15	17.3	Low	160	100	0	24	12	800	13C
Sep 22	17.4	Low	110 – 130	100	0	23	13	600	19C
Sep 28	18.0	Low	290	0	100	26	14	0	23C
Oct 05	15.3	0	- - - -	0	0	23	12	0	3C
Oct 14	14.6	0	- - - -	0	0	22	11	3,100	1C
Oct 20	13.5	0	- - - -	0	0	23	13	0	30C 1S
Oct 26	12.2	0	- - - -	0	0	24	12	400	4C
Nov 02	11.1	0	- - - -	0	0	25	14	0	0
Nov 09	8.8	0	- - - -	0	0	24	13	200	0
Nov 18	6.7	0	- - - -	0	0	26	15	0	0
Nov 24	6.9	0	- - - -	0	0	- - - -	- - - -	400	0
Dec 02	5.2	0	- - - -	0	0	27	15	0	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 22, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Brudenell River									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
May 10	5.1	0	- - - -	0	0	46	21	- - - -	0
May 18	8.7	0	- - - -	0	0	51	31	- - - -	0
May 26	6.7	0	- - - -	0	0	48	29	- - - -	0
Jun 02	9.5	Med	90 – 110	100	0	39	20	- - - -	1C
Jun 08	12.1	High	90 – 180	100	0	41	22	- - - -	1C
Jun 15	13.4	High	90 – 220	100	0	40	21	- - - -	4C
Jun 22	14.3	High	90 – 300	90	10	39	20	- - - -	1C 1S
Jun 29	15.6	High	90 – 320	85	15	38	20	- - - -	3C 1S
Jul 05	15.1	High	90 – 340	80	20	38	20	- - - -	1C 1S
Jul 14	14.6	Med	110 – 320	60	40	34	19	- - - -	2C 1S
Jul 20	19.0	Med	110 – 400	50	50	38	20	- - - -	2C
Jul 26	18.1	- - - -	- - - -	- - - -	- - - -	37	20	- - - -	1S
Aug 03	- - - -	- - - -	- - - -	- - - -	- - - -	38	21	- - - -	0
Aug 11	18.6	Med	110 – 320	20	80	34	17	- - - -	3C 1S
Aug 17	19.9	Med	110 – 380	20	80	33	18	- - - -	26C
Aug 26	22.0	High	110 – 350	30	70	29	14	- - - -	1C
Sep 01	20.5	Med	120 – 320	10	90	34	20	0	17C
Sep 09	18.4	Low	250 – 340	0	100	32	18	300	3C 1S
Sep 15	17.0	Low	260 – 310	0	100	31	18	500	14C 1S
Sep 22	17.0	Low	110 – 140	100	0	33	20	2200	7C 1S
Sep 28	17.6	0	- - - -	0	0	32	17	1900	8C 4S
Oct 07	15.2	0	- - - -	0	0	29	16	`3000	6C
Oct 14	14.7	0	- - - -	0	0	32	18	1500	4C
Oct 20	14.0	Low	310	0	100	30	16	900	2C
Oct 26	12.4	0	- - - -	0	0	31	18	0	2C
Nov 03	11.6	0	- - - -	0	0	32	18	0	5C
Nov 08	10.3	0	- - - -	0	0	30	16	0	2C
Nov 18	8.0	0	- - - -	0	0	27	14	0	0
Nov 25	7.3	0	- - - -	0	0	32	18	0	0
Dec 01	6.1	0	- - - -	0	0	27	14	400	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 22, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Cardigan River

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 04	3.9	0	- - - -	0	0	58	40	- - - -	0
May 11	5.7	0	- - - -	0	0	56	37	- - - -	0
May 18	8.2	0	- - - -	0	0	53	33	- - - -	0
May 26	5.5	0	- - - -	0	0	55	34	- - - -	0
Jun 01	9.5	0	- - - -	0	0	53	34	- - - -	0
Jun 07	11.4	Low	90 – 140	100	0	52	31	- - - -	0
Jun 15	13.4	High	90 – 240	100	0	41	20	- - - -	4C
Jun 22	19.2	High	90 – 300	95	5	36	17	- - - -	1C
Jun 29	16.1	High	90 – 350	90	10	38	20	- - - -	4C 1S
Jul 05	15.1	High	90 – 350	85	15	35	18	- - - -	2C
Jul 14	17.2	Med	90 – 380	50	50	35	17	- - - -	1C 1S
Jul 20	20.6	Med	110 – 380	50	50	34	16	- - - -	1C
Jul 26	18.7	- - - -	- - - -	- - - -	- - - -	35	16	- - - -	1C 3S
Aug 03	17.1	- - - -	- - - -	- - - -	- - - -	31	15	- - - -	2C
Aug 11	20.4	Med	120 – 350	30	70	31	14	- - - -	5C 2S
Aug 18	19.7	Med	120 – 320	30	70	41	25	- - - -	4C
Aug 26	22.1	Med	100 – 380	20	80	28	13	- - - -	1S
Sep 01	20.0	Low	110 – 220	100	0	38	21	0	2C
Sep 07	17.3	Med	130 – 400	20	80	36	20	13,200	23C 1S
Sep 15	16.8	Low	320	0	100	32	16	2,700	11C
Sep 22	17.1	Low	120 – 160	100	0	36	20	5,800	6C
Sep 28	17.7	Low	280 – 330	0	100	41	27	1,100	14C
Oct 05	15.1	0	- - - -	0	0	41	27	3,400	3C
Oct 14	14.8	0	- - - -	0	0	41	26	1,400	3C
Oct 20	14.0	Low	260	0	100	36	22	0	15C
Oct 26	13.1	0	- - - -	0	0	40	26	1,000	7C
Nov 02	11.2	0	- - - -	0	0	39	26	1,300	3C
Nov 09	9.8	0	- - - -	0	0	37	23	0	0
Nov 18	7.3	0	- - - -	0	0	39	25	0	0
Nov 24	7.6	0	- - - -	0	0	36	21	0	0
Dec 02	6.9	0	- - - -	0	0	38	24	0	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately Jun 22, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Covehead Bay									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
Apr 27	6.8	0	- - - -	0	0	62	44	- - - -	- - - -
May 13	8.3	0	- - - -	0	0	60	41	- - - -	- - - -
May 17	9.6	Low	90 – 110	100	0	59	40	- - - -	- - - -
May 27	14.2	High	90 – 130	100	0	49	30	- - - -	- - - -
May 31	11.2	High	90 – 170	100	0	50	32	- - - -	- - - -
Jun 07	17.4	High	90 – 210	100	0	44	23	- - - -	- - - -
Jun 14	14.9	High	90 – 230	100	0	43	25	- - - -	- - - -
Jun 24	18.7	High	90 – 320	90	10	48	28	- - - -	- - - -
Jun 28	20.0	High	90 – 320	85	15	44	24	- - - -	- - - -
Jul 06	15.6	High	90 – 380	60	40	45	26	- - - -	- - - -
Jul 12	16.9	Med	110 – 390	50	50	40	20	- - - -	- - - -
Jul 19	19.6	Med	110 – 380	40	60	40	21	- - - -	- - - -
Jul 27	20.3	- - - -	- - - -	- - - -	- - - -	38	20	- - - -	- - - -
Aug 05	20.3	- - - -	- - - -	- - - -	- - - -	35	17	- - - -	- - - -
Aug 10	20.7	Med	130 – 390	50	50	39	20	- - - -	- - - -
Aug 24	23.1	Low	120 – 330	50	50	37	20	- - - -	- - - -
Aug 30	20.7	Low	110 – 160	100	0	38	21	- - - -	- - - -
Sep 07	17.4	Low	140 – 180	100	0	36	20	0	- - - -
Sep 13	18.8	Low	120 – 240	100	0	41	25	900	- - - -
Sep 20	16.9	Low	210	100	0	43	28	10,800	- - - -
Sep 27	18.1	Low	270	0	100	36	21	0	- - - -
Oct 04	14.4	0	- - - -	0	0	34	20	0	- - - -
Oct 12	14.5	0	- - - -	0	0	38	22	0	- - - -
Oct 18	14.6	0	- - - -	0	0	36	20	1,400	- - - -
Nov 01	10.5	0	- - - -	0	0	38	22	300	- - - -
Nov 08	7.4	0	- - - -	0	0	35	19	1,000	- - - -
Nov 15	7.0	0	- - - -	0	0	39	23	200	- - - -
Nov 29	3.3	0	- - - -	0	0	37	21	2,000	- - - -

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 24, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Darnley Basin									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
May 05	7.8	0	- - - -	0	0	52	35	- - - -	0
May 12	8.0	0	- - - -	0	0	47	31	- - - -	0
May 20	9.6	0	- - - -	0	0	46	29	- - - -	0
May 28	9.3	Low	90 – 110	100	0	41	24	- - - -	0
Jun 03	16.1	0	- - - -	0	0	44	25	- - - -	0
Jun 09	18.5	Med	90 – 140	100	0	43	26	- - - -	0
Jun 16	15.9	High	90 – 260	98	2	43	27	- - - -	0
Jun 21	19.0	High	90 – 280	95	5	44	26	- - - -	1S
Jun 30	16.9	High	90 – 320	90	10	39	22	- - - -	1S
Jul 08	17.4	High	90 – 320	80	20	35	19	- - - -	1S
Jul 13	18.7	Med	90 – 360	50	50	28	13	- - - -	2S
Jul 21	20.3	Med	120 – 400	50	50	34	18	- - - -	11S
Jul 28	19.5	- - - -	- - - -	- - - -	- - - -	34	19	- - - -	14S
Aug 02	19.4	- - - -	- - - -	- - - -	- - - -	32	16	- - - -	2S
Aug 09	20.5	Low	150 – 400	50	50	36	19	- - - -	2S
Aug 10	22.5	Low	250	0	100	32	18	- - - -	5S
Aug 25	22.3	Low	110 – 190	100	0	32	17	- - - -	1S
Aug 31	20.1	Low	130 – 180	100	0	29	16	- - - -	9S
Sep 08	17.7	Low	120 – 160	100	0	29	18	0	1S
Sep 13	18.3	0	- - - -	0	0	28	17	300	0
Sep 20	18.6	0	- - - -	0	0	34	22	2,600	0
Sep 28	18.5	0	- - - -	0	0	32	20	3,000	0
Oct 05	15.2	0	- - - -	0	0	34	21	200	0
Oct 12	14.9	0	- - - -	0	0	29	17	0	0
Oct 20	13.4	0	- - - -	0	0	31	19	300	0
Oct 26	10.5	0	- - - -	0	0	32	20	0	0
Nov 03	9.7	0	- - - -	0	0	37	23	600	0
Nov 08	7.9	0	- - - -	0	0	37	26	400	0
Nov 15	7.1	0	- - - -	0	0	31	20	1,500	0
Nov 29	3.0	0	- - - -	0	0	35	22	4,000	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately Jun 16, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Grand River									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
Jun 03	15.2	Med	90 – 130	100	0	----	----	----	----
Jun 08	19.9	Med	90 – 200	100	0	----	----	----	----
Jun 15	18.1	High	90 – 240	100	0	----	----	----	----
Jun 22	20.3	High	90 – 320	90	10	----	----	----	----
The setting of mussel larvae occurs when they reach a size of at least 250 microns. Setting started in this area approximately June 22, 2021.									

Lennox Channel

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 05	7.6	0	- - - -	0	0	53	37	- - - -	0
May 10	8.0	0	- - - -	0	0	52	37	- - - -	0
May 21	11.1	0	- - - -	0	0	47	31	- - - -	0
Jun 03	13.9	Low	90 – 120	100	0	45	27	- - - -	0
Jun 11	15.7	High	90 – 170	100	0	34	18	- - - -	0
Jun 16	16.7	High	90 – 240	100	0	34	20	- - - -	1S
Jun 21	18.7	High	90 – 300	90	10	35	18	- - - -	15S
Jun 30	21.1	High	90 – 350	85	15	34	18	- - - -	38S
Jul 08	18.1	High	90 – 360	60	40	28	15	- - - -	21S
Jul 13	18.8	Med	110 – 380	50	50	36	19	- - - -	3S
Jul 28	20.5	- - - -	- - - -	- - - -	- - - -	26	12	- - - -	0
Aug 02	19.3	- - - -	- - - -	- - - -	- - - -	26	12	- - - -	3S
Aug 09	20.7	Low	250 – 320	0	100	26	13	- - - -	1S
Aug 25	23.4	Low	120 – 320	50	50	24	12	- - - -	1S
Aug 31	20.7	Low	120 – 160	100	0	23	11	- - - -	1S
Sep 08	18.0	Low	110 – 180	100	0	26	16	0	1S
Sep 15	17.2	Low	180	100	0	24	13	0	2S
Sep 20	18.2	Low	180 – 200	100	0	24	12	5,500	0
Sep 28	18.6	0	- - - -	0	0	26	14	500	0
Oct 05	16.1	0	- - - -	0	0	25	13	700	0
Oct 12	15.6	0	- - - -	0	0	26	13	0	0
Oct 20	13.7	0	- - - -	0	0	23	12	0	0
Oct 26	11.8	0	- - - -	0	0	24	14	0	0
Nov 03	9.6	0	- - - -	0	0	23	11	400	0
Nov 08	8.7	0	- - - -	0	0	22	12	3,300	0
Nov 15	7.1	0	- - - -	0	0	22	12	2,900	0
Nov 29	2.8	0	- - - -	0	0	23	12	19,200	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 21, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

March Water

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 10	7.1	0	- - - -	0	0	51	33	- - - -	0
May 27	13.1	0	- - - -	0	0	38	21	- - - -	0
Jun 03	15.2	0	- - - -	0	0	38	20	- - - -	0
Jun 09	18.3	Low	90 – 110	100	0	34	18	- - - -	0
Jun 16	16.3	High	90 – 210	100	0	35	18	- - - -	0
Jun 21	18.9	High	90 – 290	95	5	34	18	- - - -	1S
Jun 30	20.2	High	90 – 320	90	10	36	19	- - - -	2S
Jul 08	18.1	Med	90 – 330	70	30	31	16	- - - -	13S
Jul 13	18.6	Med	90 – 330	50	50	27	13	- - - -	1S
Jul 21	21.2	Med	90 – 340	40	60	30	16	- - - -	1S
Jul 28	20.4	- - - -	- - - -	- - - -	- - - -	27	13	- - - -	2S
Aug 02	19.6	- - - -	- - - -	- - - -	- - - -	26	13	- - - -	0
Aug 09	21.7	Low	280 – 380	0	100	27	13	- - - -	1S
Aug 17	23.1	Low	260	0	100	23	11	- - - -	3S
Aug 25	23.3	Low	120 – 200	100	0	22	12	- - - -	3S
Aug 31	20.5	Low	110 – 180	100	0	23	11	- - - -	7S
Sep 08	17.1	Low	110 – 140	100	0	24	14	0	2S
Sep 15	17.8	0	- - - -	0	0	25	14	0	1S
Sep 20	18.3	0	- - - -	0	0	24	13	300	0
Sep 28	18.7	0	- - - -	0	0	26	15	1,800	0
Oct 05	16.2	0	- - - -	0	0	23	12	0	0
Oct 12	15.3	0	- - - -	0	0	24	14	0	0
Oct 20	13.8	0	- - - -	0	0	26	16	0	0
Oct 26	12.1	0	- - - -	0	0	24	15	0	0
Nov 03	9.8	0	- - - -	0	0	25	15	0	0
Nov 08	8.2	0	- - - -	0	0	24	14	1,800	0
Nov 15	7.2	0	- - - -	0	0	25	15	0	0
Nov 29	2.6	0	- - - -	0	0	25	14	10,600	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 21, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Murray River

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 05	6.4	0	- - - -	0	0	50	50	- - - -	0
May 11	6.7	0	- - - -	0	0	52	35	- - - -	0
May 18	9.5	0	- - - -	0	0	40	26	- - - -	0
May 26	8.6	0	- - - -	0	0	43	26	- - - -	2C
Jun 02	10.9	Med	90 – 110	100	0	42	25	- - - -	10C
Jun 07	14.0	Med	90 – 170	100	0	N/A	N/A	- - - -	27C
Jun 18	15.9	High	90 – 270	98	2	36	17	- - - -	15C
Jun 22	18.2	High	90 – 300	95	5	35	16	- - - -	50C 12S
Jun 29	17.0	High	90 – 300	90	10	31	14	- - - -	11C 1S
Jul 05	15.1	High	90 – 370	85	15	31	15	- - - -	23C
Jul 14	18.0	Med	110 - 390	60	40	32	16	- - - -	16C
Jul 23	17.5	Med	110 – 350	40	60	29	14	- - - -	3C
Jul 26	18.4	- - - -	- - - -	- - - -	- - - -	29	14	- - - -	1C 11S
Aug 03	18.6	- - - -	- - - -	- - - -	- - - -	27	15	- - - -	7C 10S
Aug 11	20.1	Med	120 – 220	100	0	30	18	- - - -	6C
Aug 17	22.1	Low	110 – 310	40	60	27	15	- - - -	9C 1S
Aug 27	23.3	Low	120 – 340	50	50	27	14	- - - -	4C 1S
Sep 01	21.5	Low	120 – 330	50	50	25	13	0	6C 2S
Sep 09	18.5	Low	160 – 320	50	50	24	12	0	7C
Sep 15	17.2	Low	160	100	0	25	13	11,800	11C
Sep 21	18.7	Low	120 – 180	100	0	24	12	1,000	80C 1S
Sep 28	17.9	0	- - - -	0	0	25	13	700	14C
Oct 07	15.1	Low	200 – 290	50	50	24	13	200	6C 1S
Oct 14	14.7	0	- - - -	0	0	24	13	0	1C
Oct 21	13.2	0	- - - -	0	0	23	12	0	3C
Oct 26	12.6	0	- - - -	0	0	22	12	0	1C
Nov 03	11.0	0	- - - -	0	0	21	11	0	0
Nov 08	9.1	0	- - - -	0	0	24	13	0	1C
Nov 18	6.9	0	- - - -	0	0	22	11	300	0
Nov 25	6.9	0	- - - -	0	0	22	12	1,000	0
Dec 01	4.7	0	- - - -	0	0	27	16	0	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately Jun 18, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

New London Bay									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
Apr 29	6.1	0	- - - -	0	0	47	28	- - - -	0
May 14	8.6	0	- - - -	0	0	46	27	- - - -	0
May 20	9.3	0	- - - -	0	0	49	30	- - - -	0
May 28	12.3	Med	90 – 120	100	0	42	26	- - - -	0
Jun 04	14.3	Med	90 – 140	100	0	46	27	- - - -	0
Jun 11	15.6	Med	90 – 160	100	0	46	26	- - - -	0
Jun 17	15.8	High	90 – 260	98	2	41	23	- - - -	0
Jun 25	17.3	High	90 – 290	90	10	40	23	- - - -	0
Jun 30	19.3	High	90 – 380	80	20	41	22	- - - -	0
Jul 07	17.8	High	90 – 380	60	40	36	19	- - - -	0
Jul 16	18.3	Med	90 – 390	50	50	37	19	- - - -	0
Jul 23	19.0	Med	110 – 360	40	60	34	17	- - - -	0
Jul 29	20.4	- - - -	- - - -	- - - -	- - - -	35	18	- - - -	0
Aug 06	20.0	- - - -	- - - -	- - - -	- - - -	35	18	- - - -	0
Aug 09	20.6	Low	110 – 250	50	50	33	17	- - - -	0
Aug 16	23.3	Low	130 – 230	100	0	32	16	- - - -	1S
Aug 23	22.8	Low	120 – 260	20	80	33	18	- - - -	3S
Sep 03	21.0	Low	110 – 200	100	0	30	14	0	16S
Sep 08	17.3	Low	120 – 290	50	50	29	17	12,700	0
Sep 13	17.1	Low	120 – 160	100	0	35	19	60,800	0
Sep 20	17.9	Low	160	100	0	36	21	58,300	0
Sep 28	17.7	0	- - - -	0	0	38	23	2,400	0
Oct 05	15.5	0	- - - -	0	0	37	21	1,100	0
Oct 12	15.6	0	- - - -	0	0	39	24	0	0
Oct 20	14.3	0	- - - -	0	0	35	19	200	0
Oct 26	12.5	0	- - - -	0	0	39	25	0	0
Nov 03	10.6	0	- - - -	0	0	35	20	1,500	0
Nov 08	9.0	0	- - - -	0	0	34	21	3,200	0
Nov 15	7.7	0	- - - -	0	0	40	25	7,300	0
Nov 29	1.3	0	- - - -	0	0	42	25	3,400	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 17, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Nine Mile Creek

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 10	6.8	0	- - - -	0	0	57	41	- - - -	- - - -
May 18	10.5	0	- - - -	0	0	47	29	- - - -	- - - -
Jun 01	11.6	Med	90 – 150	100	0	50	31	- - - -	- - - -
Jun 09	14.4	Med	90 – 190	100	0	43	23	- - - -	- - - -
Jun 16	14.1	High	90 – 240	100	0	45	27	- - - -	- - - -
Jun 21	16.1	High	90 – 310	95	5	42	23	- - - -	- - - -
Jun 29	17.6	High	90 – 350	90	10	40	21	- - - -	- - - -
Jul 05	15.1	High	90 – 340	85	15	38	20	- - - -	- - - -
Jul 12	17.4	High	90 – 360	70	30	38	19	- - - -	- - - -
July 20	20.6	Med	120 – 400	50	50	37	18	- - - -	- - - -
Aug 04	18.9	- - - -	- - - -	- - - -	- - - -	33	16	- - - -	- - - -
Aug 10	20.1	Low	120 – 210	100	0	31	15	- - - -	- - - -
Aug 26	21.7	Low	110 – 310	50	50	33	16	- - - -	- - - -
Sep 01	20.0	Med	120 – 380	20	80	32	17	0	- - - -
Sep 08	17.8	Low	100 – 220	100	0	31	16	900	- - - -
Sep 16	17.1	Low	180 – 300	50	50	31	16	13,200	- - - -
Sep 20	18.0	Low	200	100	0	32	17	1,800	- - - -
Sep 28	18.2	0	- - - -	0	0	32	17	700	- - - -
Oct 04	16.1	0	- - - -	0	0	31	17	0	- - - -
Oct 12	14.9	0	- - - -	0	0	34	19	0	- - - -
Oct 18	15.1	0	- - - -	0	0	35	20	0	- - - -
Oct 26	13.2	0	- - - -	0	0	36	22	0	- - - -
Nov 03	11.4	0	- - - -	0	0	37	23	0	- - - -
Nov 09	9.0	0	- - - -	0	0	37	23	o	- - - -
Nov 17	7.6	0	- - - -	0	0	40	26	600	- - - -
Nov 23	6.9	0	- - - -	0	0	40	23 5	0	- - - -
Nov 29	5.2	0	- - - -	0	0	43	28	0	- - - -

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 21, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

North Lake									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
May 31	10.3	0	- - - -	0	0	- - - -	- - - -	- - - -	- - - -
Jun 09	17.9	Low	90 – 110	100	0	- - - -	- - - -	- - - -	- - - -
Jun 14	14.9	Med	110 – 170	100	0	- - - -	- - - -	- - - -	- - - -
Jun 23	15.8	High	110 – 300	95	5	- - - -	- - - -	- - - -	- - - -
Jun 30	18.7	High	110 – 330	95	5	- - - -	- - - -	- - - -	- - - -

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 23, 2021.

Orwell Bay									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
May 04	8.1	0	- - - -	0	0	46	31	- - - -	- - - -
May 11	8.0	0	- - - -	0	0	45	29	- - - -	- - - -
May 18	10.8	0	- - - -	0	0	43	29	- - - -	- - - -
May 26	12.5	0	- - - -	0	0	33	19	- - - -	- - - -
Jun 01	12.5	Med	90 – 150	100	0	35	19	- - - -	- - - -
Jun 07	16.3	Med	90 – 190	100	0	31	18	- - - -	- - - -
Jun 16	13.3	Med	90 – 240	100	0	31	16	- - - -	- - - -
Jun 21	18.6	Med	90 – 300	95	5	28	14	- - - -	- - - -
Jun 29	19.1	High	90 – 350	90	10	27	14	- - - -	- - - -
Jul 08	17.6	High	90 – 320	80	20	27	14	- - - -	- - - -
Jul 12	17.9	High	110 – 390	60	40	28	15	- - - -	- - - -
Jul 21	21.0	Med	110 – 400	50	50	29	14	- - - -	- - - -
Aug 04	17.3	- - - -	- - - -	- - - -	- - - -	27	13	- - - -	- - - -
Aug 10	20.7	Low	150 – 190	100	0	26	13	- - - -	- - - -
Aug 26	22.6	Low	120 – 340	50	50	25	13	- - - -	- - - -
Sep 08	18.3	Low	130	100	0	24	13	0	- - - -
Sep 15	17.1	Low	120 – 180	100	0	24	14	900	- - - -
Sep 20	17.9	Low	120 – 170	100	0	25	14	600	- - - -
Sep 28	17.6	0	- - - -	0	0	25	14	0	- - - -
Oct 04	15.9	0	- - - -	0	0	24	13	0	- - - -
Oct 12	14.1	0	- - - -	0	0	23	12	0	- - - -
Oct 18	13.8	0	- - - -	0	0	25	13	0	- - - -
Oct 26	12.2	0	- - - -	0	0	23	13	0	- - - -
Nov 03	11.0	0	- - - -	0	0	25	14	0	- - - -
Nov 08	8.0	0	- - - -	0	0	25	14	0	- - - -
Nov 15	7.6	0	- - - -	0	0	28	16	0	- - - -
Nov 24	5.8	0	- - - -	0	0	27	16	0	- - - -
Nov 29	4.2	0	- - - -	0	0	29	18	0	- - - -

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 21, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Rustico Bay

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
Apr 29	5.6	0	- - - -	0	0	59	42	- - - -	0
May 14	9.2	0	- - - -	0	0	56	40	- - - -	0
May 19	9.6	0	- - - -	0	0	59	44	- - - -	0
May 28	12.3	High	90 – 130	100	0	49	30	- - - -	0
Jun 04	15.9	Med	90 – 150	100	0	46	26	- - - -	0
Jun 09	19.1	Med	90 – 190	100	0	51	30	- - - -	0
Jun 17	16.4	High	90 – 250	98	2	48	28	- - - -	0
Jun 25	18.6	High	90 – 330	90	10	45	25	- - - -	0
Jun 30	19.9	High	90 – 360	85	15	47	27	- - - -	0
Jul 07	17.8	High	110 – 330	70	30	46	25	- - - -	0
Jul 16	19.8	Med	110 – 400	50	50	43	23	- - - -	8S
Jul 29	20.4	- - - -	- - - -	- - - -	- - - -	41	22	- - - -	1S
Aug 06	20.7	- - - -	- - - -	- - - -	- - - -	39	21	- - - -	1S
Aug 09	20.6	Low	120 – 310	50	50	39	22	- - - -	1S
Aug 23	22.8	Low	110 – 280	30	70	35	19	- - - -	1S
Sep 02	21.1	Low	120 – 180	100	0	31	17	0	0
Sep 08	17.5	Low	120 – 290	50	50	31	18	1,300	0
Sep 13	17.7	Low	110 – 150	100	0	31	17	200	0
Sep 20	17.4	Low	130 – 150	100	0	34	21	300	0
Sep 28	18.1	0	- - - -	0	0	34	20	0	0
Oct 05	14.7	0	- - - -	0	0	33	19	200	0
Oct 12	14.3	0	- - - -	0	0	32	19	0	0
Oct 20	14.2	0	- - - -	0	0	33	21	0	0
Oct 26	12.1	0	- - - -	0	0	31	19	0	0
Nov 03	10.2	0	- - - -	0	0	31	18	0	0
Nov 08	8.2	0	- - - -	0	0	29	17	600	0
Nov 15	7.2	0	- - - -	0	0	30	17	2,900	0
Nov 29	2.3	0	- - - -	0	0	30	18	0	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 17, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Savage Harbour

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
Apr 28	5.3	0	- - - -	0	0	27	21	- - - -	- - - -
May 13	7.0	0	- - - -	0	0	40	24	- - - -	- - - -
May 17	4.8	0	- - - -	0	0	40	26	- - - -	- - - -
May 27	12.7	Low	90 – 110	100	0	39	24	- - - -	- - - -
May 31	7.7	Low	90 – 110	100	0	35	19	- - - -	- - - -
Jun 07	17.1	High	90 – 160	100	0	29	14	- - - -	- - - -
Jun 14	14.9	Med	90 – 210	100	0	27	14	- - - -	- - - -
Jun 24	16.2	Med	90 – 340	95	5	27	14	- - - -	- - - -
Jun 28	18.0	High	90 – 310	90	10	25	11	- - - -	- - - -
Jul 06	15.0	High	90 – 320	80	20	24	12	- - - -	- - - -
Jul 12	14.4	Med	110 – 380	50	50	23	11	- - - -	- - - -
Jul 19	21.6	Med	110 – 250	50	50	26	12	- - - -	- - - -
Jul 27	19.3	- - - -	- - - -	- - - -	- - - -	25	12	- - - -	- - - -
Aug 05	20.6	- - - -	- - - -	- - - -	- - - -	25	12	- - - -	- - - -
Aug 10	19.7	Low	110 – 300	50	50	22	10	- - - -	- - - -
Aug 24	21.9	Low	120 – 300	10	90	23	11	- - - -	- - - -
Aug 30	20.0	Low	130 – 150	100	0	23	11	- - - -	- - - -
Sep 07	17.2	Low	120 – 160	100	0	20	9	0	- - - -
Sep 13	18.0	Low	110 – 130	100	0	22	11	0	- - - -
Sep 20	16.9	0	- - - -	0	0	24	13	1,200	- - - -
Sep 27	17.1	0	- - - -	0	0	23	11	0	- - - -
Oct 04	14.3	0	- - - -	0	0	32	18	0	- - - -
Oct 12	13.5	0	- - - -	0	0	31	17	400	- - - -
Oct 18	14.3	0	- - - -	0	0	31	16	0	- - - -
Oct 25	11.8	0	- - - -	0	0	29	15	0	- - - -
Nov 01	10.5	0	- - - -	0	0	29	16	0	- - - -
Nov 08	8.8	0	- - - -	0	0	30	15	0	- - - -
Nov 15	6.7	0	- - - -	0	0	30	17	0	- - - -
Nov 22	5.4	0	- - - -	0	0	29	15	1,400	- - - -
Nov 29	3.3	0	- - - -	0	0	31	16	500	- - - -

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately Jun 24, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

St. Mary's Bay

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 10	6.3	0	- - - -	0	0	54	36	- - - -	0
May 18	10.3	0	- - - -	0	0	52	35	- - - -	0
May 26	8.7	0	- - - -	0	0	54	36	- - - -	0
Jun 02	10.3	High	90 – 140	100	0	39	21	- - - -	1C
Jun 08	12.3	Med	90 – 190	100	0	41	22	- - - -	0
Jun 18	16.6	High	90 – 280	95	5	34	17	- - - -	1C
Jun 22	15.0	High	90 – 290	90	10	34	17	- - - -	1C
Jun 29	16.9	High	90 – 340	85	15	35	17	- - - -	5C 4S
Jul 14	17.4	Med	90 – 300	50	50	30	15	- - - -	8C 1S
Jul 23	18.4	Med	110 – 300	30	70	31	15	- - - -	3C
Jul 26	18.0	- - - -	- - - -	- - - -	- - - -	32	16	- - - -	6C 3S
Aug 03	18.1	- - - -	- - - -	- - - -	- - - -	28	14	- - - -	2C
Aug 12	20.1	Med	120 – 320	20	80	27	13	- - - -	4C 3S
Aug 18	21.6	Med	130 – 300	20	80	29	15	- - - -	11C
Aug 27	22.6	Med	110 – 340	20	80	28	14	- - - -	6C
Sep 01	21.0	Med	130 – 310	20	80	28	14	0	1C 1S
Sep 09	18.3	Med	140 – 340	29	15	29	15	4,000	8C 2S
Sep 15	17.6	Low	130 – 290	28	14	28	14	600	15C
Sep 22	17.2	Low	350	0	100	27	13	3,700	30C
Sep 28	17.7	Low	320	0	100	28	15	0	17C 5S
Oct 07	14.9	Low	260 – 380	0	100	26	14	0	8C 1S
Oct 14	14.6	0	- - - -	0	0	27	14	0	2C
Oct 21	13.5	0	- - - -	0	0	29	14	0	3C
Oct 26	12.2	0	- - - -	0	0	27	15	0	2C
Nov 93	11.0	0	- - - -	0	0	25	13	300	4C
Nov 08	9.7	0	- - - -	0	0	30	18	0	0
Nov 18	6.6	0	- - - -	0	0	29	17	0	0
Nov 25	6.3	0	- - - -	0	0	28	16	0	0
Dec 01	4.8	0	- - - -	0	0	26	14	400	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 18, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

St. Peter's Bay									
Date	**Water Temp**	**Mussel larvae**	**Size (microns)**	**% Pre-set**	**% Set-size**	**Steamed Meat Yield**	**European Meat Yield**	***#Pseudo-nitzschia* (cells/L)**	**Tunicate Larvae**
Apr 28	5.3	0	- - - -	0	0	58	40	- - - -	0
May 13	6.9	0	- - - -	0	0	54	36	- - - -	0
May 17	8.5	0	- - - -	0	0	44	27	- - - -	0
Nay 27	11.2	Low	90 – 110	100	0	48	29	- - - -	0
May 31	9.0	Med	90 – 130	100	0	45	27	- - - -	0
Jun 07	17.2	High	90 – 210	100	0	42	21	- - - -	0
Jun 14	15.0	High	90 – 250	98	2	44	25	- - - -	0
Jun 24	17.7	High	90 – 320	90	10	47	26	- - - -	0
Jun 28	18.4	High	90 – 340	85	15	36	17	- - - -	0
Jul 06	16.2	High	90 – 360	70	30	38	19	- - - -	0
Jul 12	15.5	Med	90 – 350	50	50	34	15	- - - -	0
Jul 19	21.8	Med	110 – 280	40	60	34	16	- - - -	0
Jul 27	18.7	- - - -	- - - -	- - - -	- - - -	31	14	- - - -	0
Aug 05	20.6	- - - -	- - - -	- - - -	- - - -	29	13	- - - -	0
Aug 10	20.7	Low	120 – 380	50	50	28	12	- - - -	0
Aug 24	21.7	Low	140 – 380	20	80	27	12	- - - -	0
Aug 30	20.7	Low	130 – 310	50	50	25	11	- - - -	0
Sep 07	17.8	Low	110 – 280	50	50	23	12	0	0
Sep 13	18.8	Low	120 – 140	100	0	26	12	0	0
Sep 20	17.1	Low	120 – 170	100	0	29	16	0	0
Sep 27	17.5	0	- - - -	0	0	29	14	200	0
Oct 04	14.5	0	- - - -	0	0	28	14	0	0
Oct 12	13.9	0	- - - -	0	0	29	16	0	0
Oct 18	14.3	0	- - - -	0	0	29	15	0	0
Oct 25	12.0	0	- - - -	0	0	27	15	0	0
Nov 01	10.7	0	- - - -	0	0	27	14	0	0
Nov 08	8.0	0	- - - -	0	0	28	15	500	0
Nov 15	7.4	0	- - - -	0	0	28	16	0	0
Nov 22	5.1	0	- - - -	0	0	25	13	300	0
Nov 29	3.6	0	- - - -	0	0	26	13	1,600	0

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 14, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Tracadie Bay

Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	*#Pseudo-nitzschia* (cells/L)	Tunicate Larvae
Apr 27	5.5	0	- - - -	0	0	51	33	- - - -	- - - -
May 13	5.9	0	- - - -	0	0	47	30	- - - -	- - - -
May 17	6.4	0	- - - -	0	0	48	30	- - - -	- - - -
May 27	10.9	Low	90 – 110	100	0	47	30	- - - -	- - - -
May 31	8.5	Low	90 – 150	100	0	46	27	- - - -	- - - -
Jun 07	15.9	High	90 – 190	100	0	39	23	- - - -	- - - -
Jun 14	14.2	High	90 – 250	98	2	41	24	- - - -	- - - -
Jun 24	17.5	High	90 – 330	90	10	35	19	- - - -	- - - -
Jun 28	16.7	High	90 – 310	80	20	36	17	- - - -	- - - -
Jul 06	12.3	High	90 – 330	70	30	- - - -	- - - -	- - - -	- - - -
Jul 12	15.1	High	90 – 360	50	50	31	15	- - - -	- - - -
Jul 19	21.0	Med	110 – 320	40	60	32	15	- - - -	- - - -
Jul 27	20.2	- - - -	- - - -	- - - -	- - - -	27	13	- - - -	- - - -
Aug 05	20.0	- - - -	- - - -	- - - -	- - - -	29	14	- - - -	- - - -
Aug 10	20.8	Low	150 – 200	100	0	26	12	- - - -	- - - -
Aug 24	22.3	Low	130 – 370	20	80	27	13	- - - -	- - - -
Aug 30	20.4	Low	130 – 180	100	0	25	12	0	- - - -
Sep 08	17.4	Low	120 – 140	100	0	24	13	3,400	- - - -
Sep 13	17.9	0	- - - -	0	0	27	14	0	- - - -
Sep 20	16.7	0	- - - -	0	0	28	13	900	- - - -
Sep 27	17.3	Low	380	0	100	27	13	0	- - - -
Oct 04	14.5	0	- - - -	0	0	25	13	1,100	- - - -
Oct 12	13.5	0	- - - -	0	0	24	12	0	- - - -
Oct 18	N/A	0	- - - -	0	0	26	14	0	- - - -
Oct 25	11.7	0	- - - -	0	0	26	12	0	- - - -
Nov 01	10.6	0	- - - -	0	0	25	13	0	- - - -
Nov 08	7.9	0	- - - -	0	0	28	14	900	- - - -
Nov 15	7.4	0	- - - -	0	0	28	15	0	- - - -
Nov 22	5.6	0	- - - -	0	0	- - - -	- - - -	2,300	- - - -
Nov 29	3.3	0	- - - -	0	0	30	15	400	- - - -

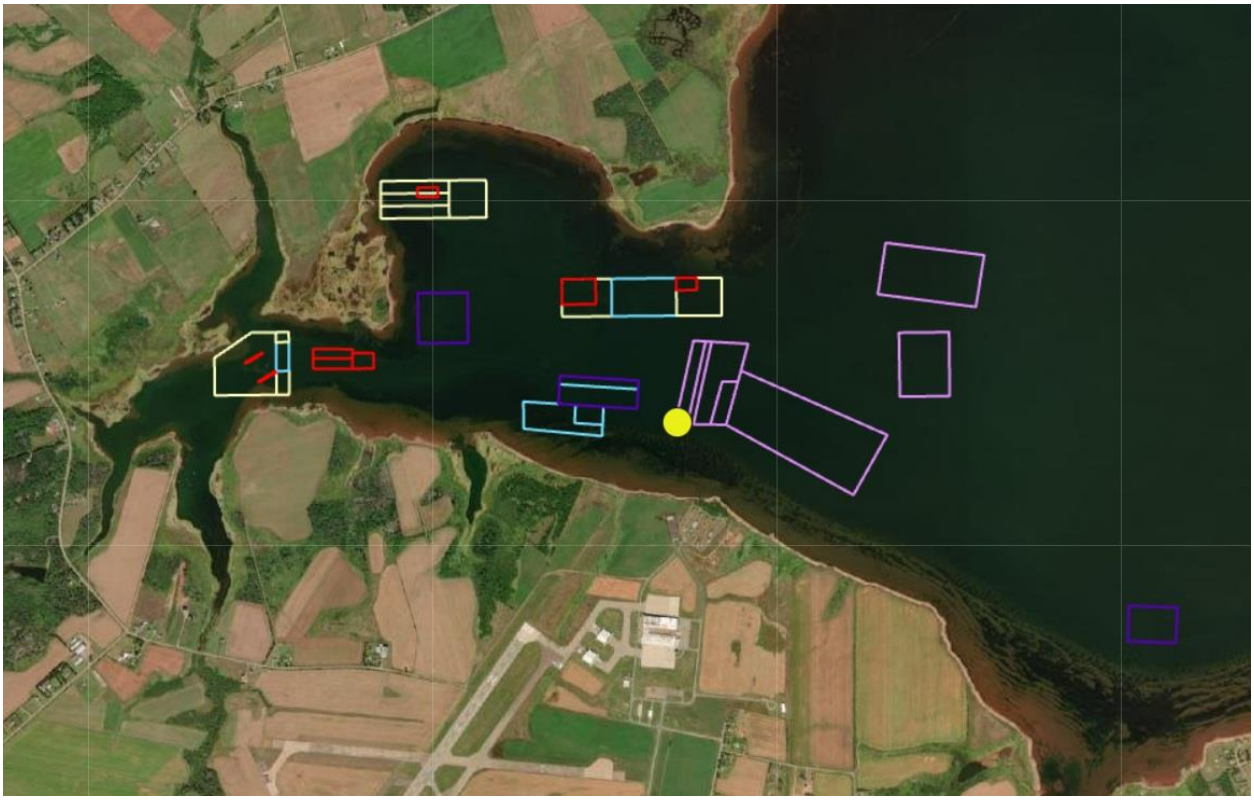
The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately Jun 14, 2021.
C= Ciona S=Styela GS=Goldenstar V=Violet

Winter Bay

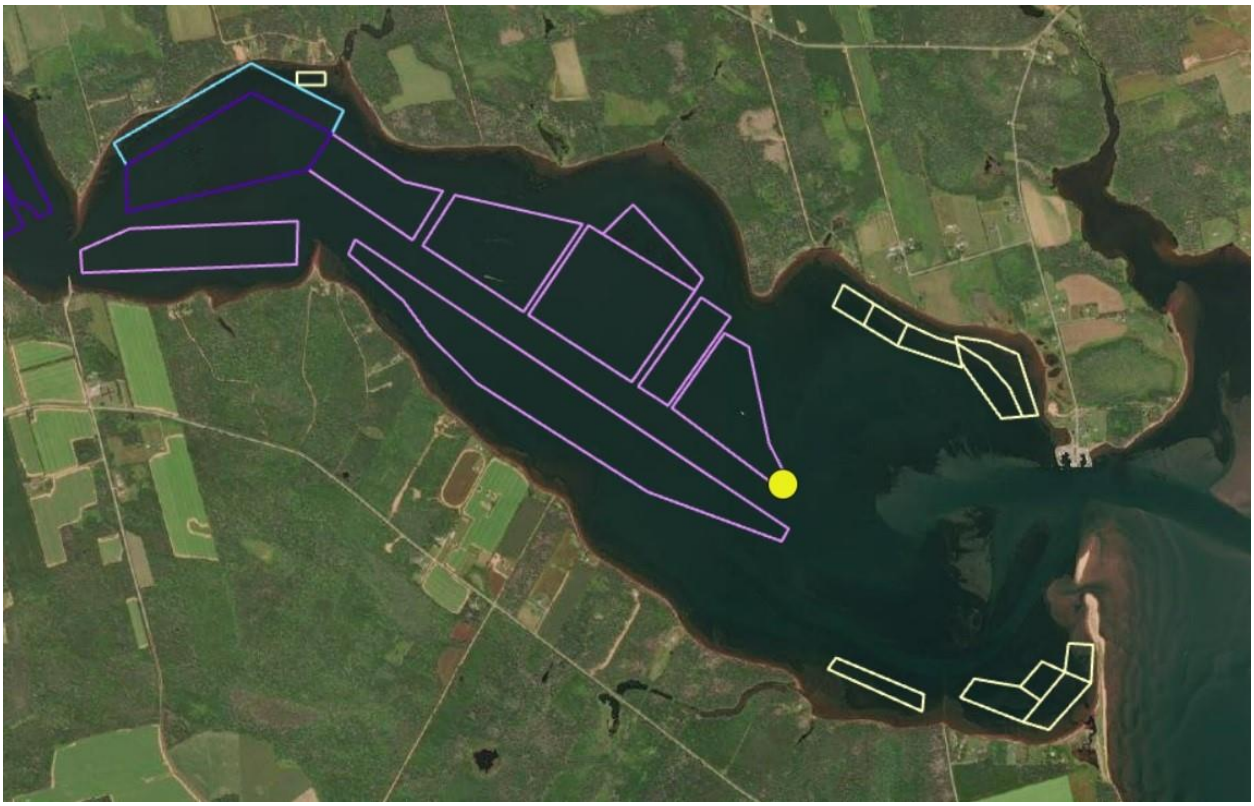
Date	Water Temp	Mussel larvae	Size (microns)	% Pre-set	% Set-size	Steamed Meat Yield	European Meat Yield	#*Pseudo-nitzschia* (cells/L)	Tunicate Larvae
May 31	12.5	Med	90 – 130	100	0	----	----	----	----
Jun 07	16.8	High	90 – 200	100	0	----	----	----	----
Jun 14	16.5	High	90 – 250	98	2	----	----	----	----
Jun 24	18.7	High	90 – 300	90	10	----	----	----	----
Jun 28	19.6	High	90 – 380	85	15	----	----	----	----
Jul 06	16.0	High	90 – 380	70	30	----	----	----	----
Jul 12	17.9	High	90 – 380	50	50	----	----	----	----
Jul 19	20.6	Med	90 – 400	40	60	----	----	----	----

The setting of mussel larvae occurs when they reach a size of at least 250 microns.
Setting started in this area approximately June 14, 2021.

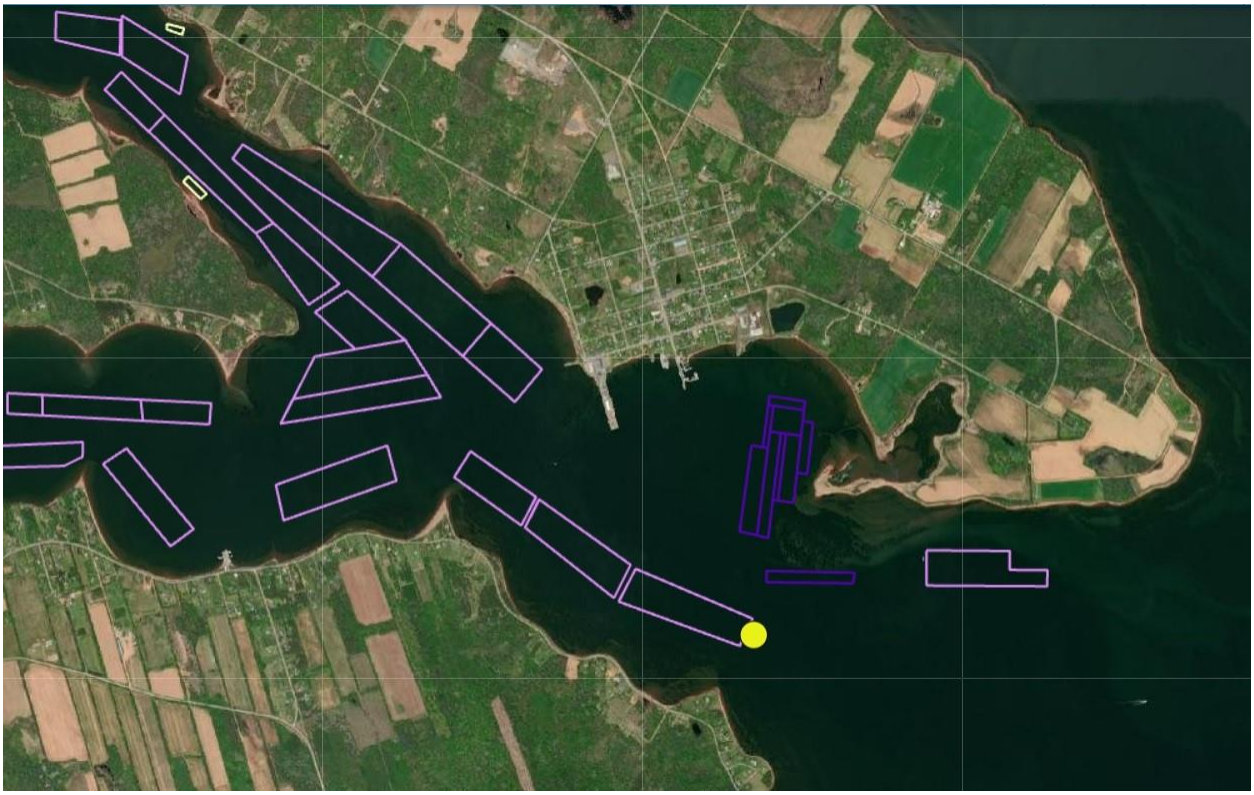
APPENDIX II MAPS OF SAMPLE SITES



Bentick Cove Mussel Monitoring Site



Boughton River Mussel Monitoring Site

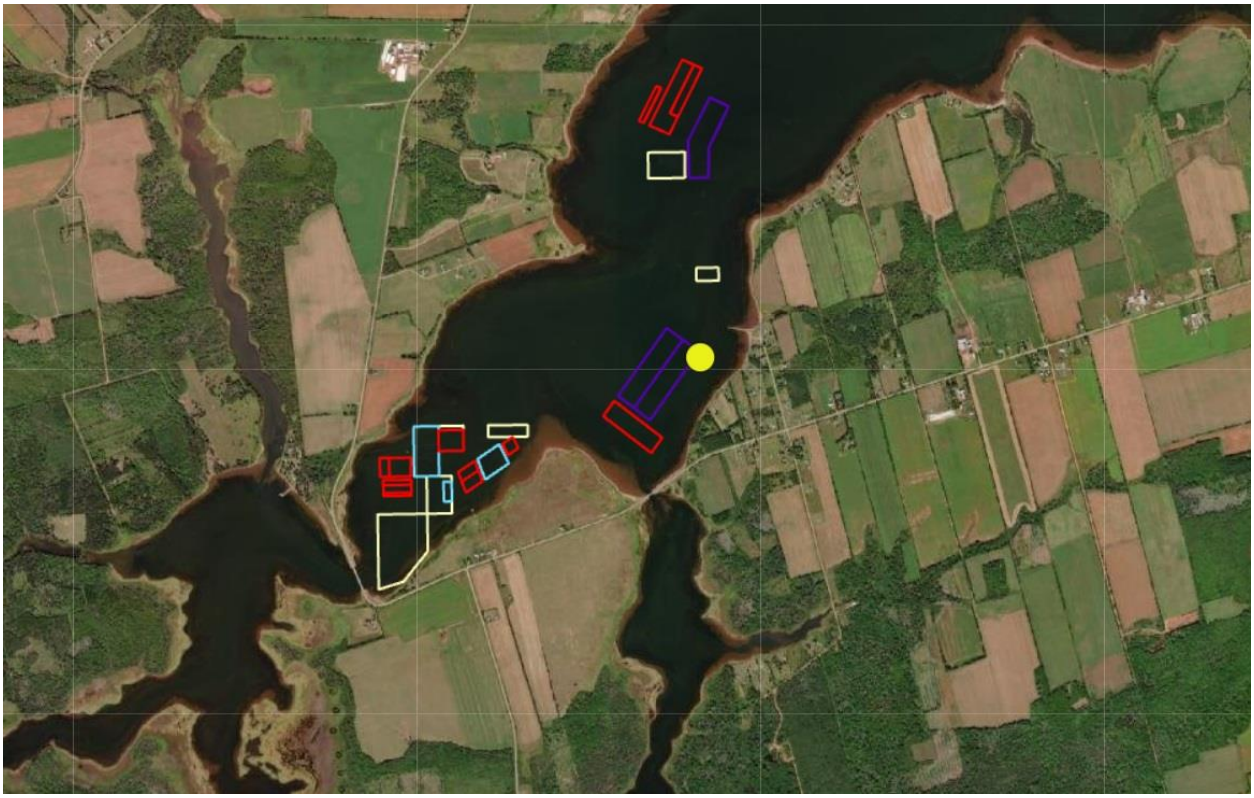


Brudenell River Mussel Monitoring Site

Cardigan River Mussel Monitoring Site

Covehead Bay Mussel Monitoring Site

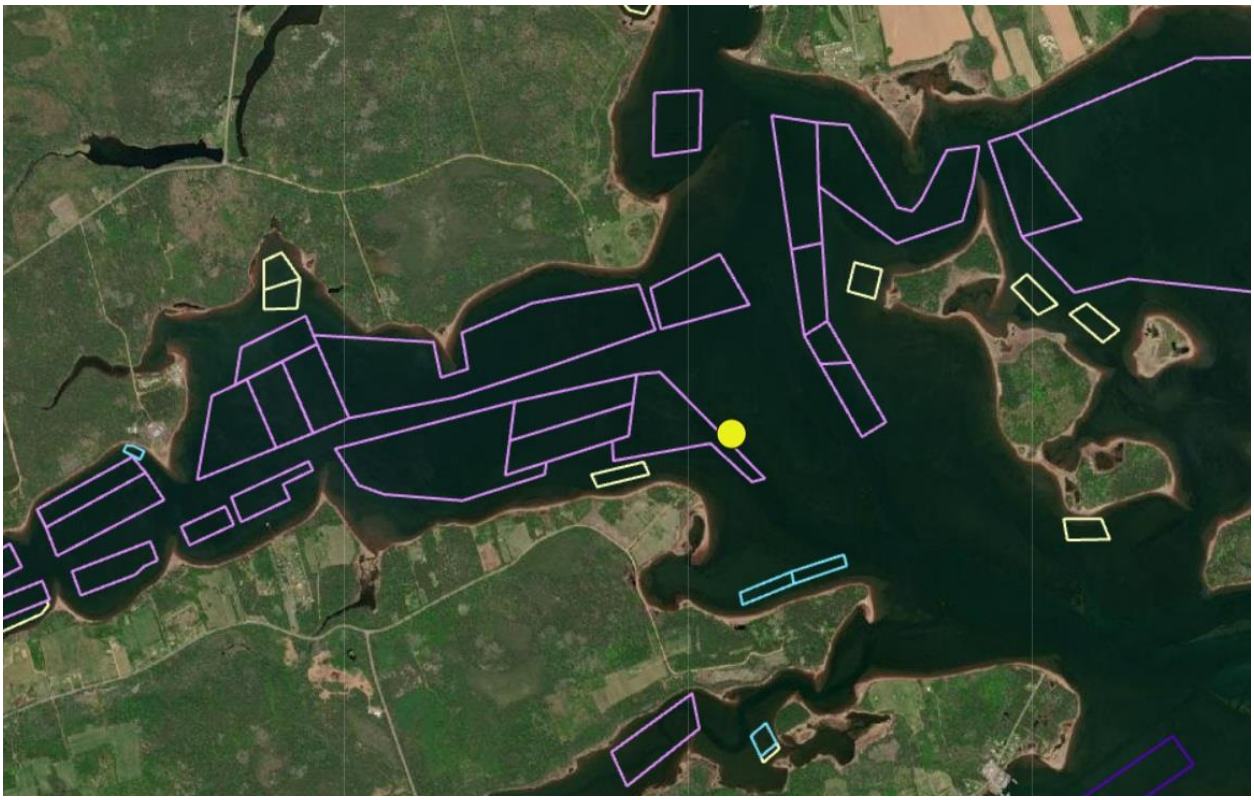
Darnley Basin Mussel Monitoring Site



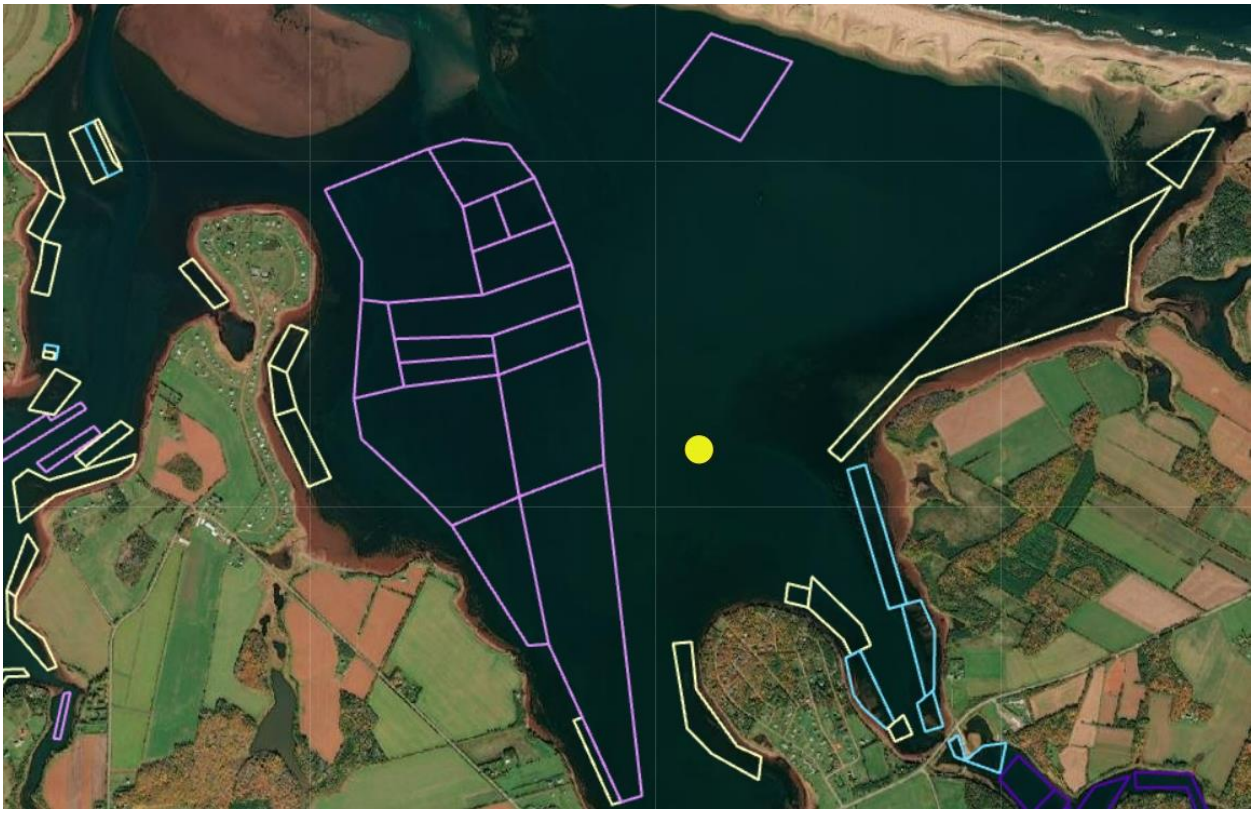
Grand River Mussel Monitoring Site

Lennox Channel Mussel Monitoring Site

March Water Mussel Monitoring Site

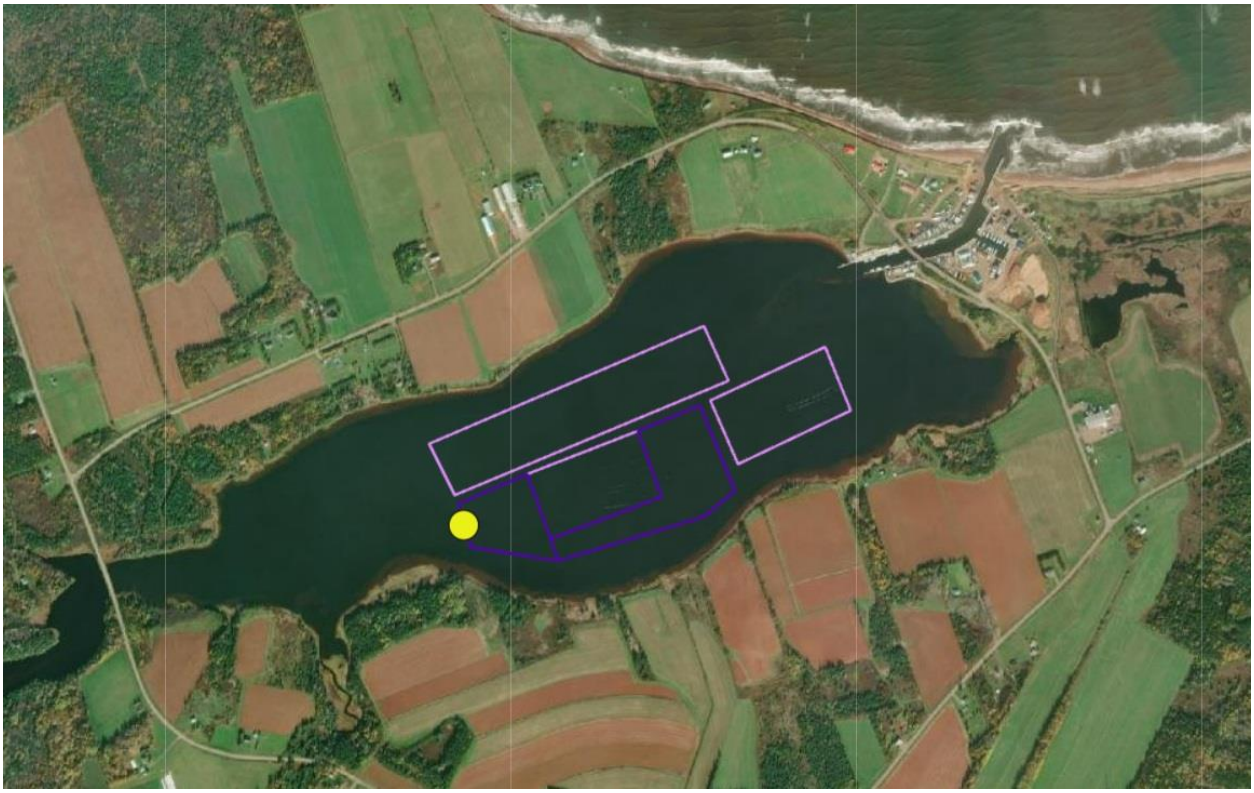


Murray River Mussel Monitoring Site



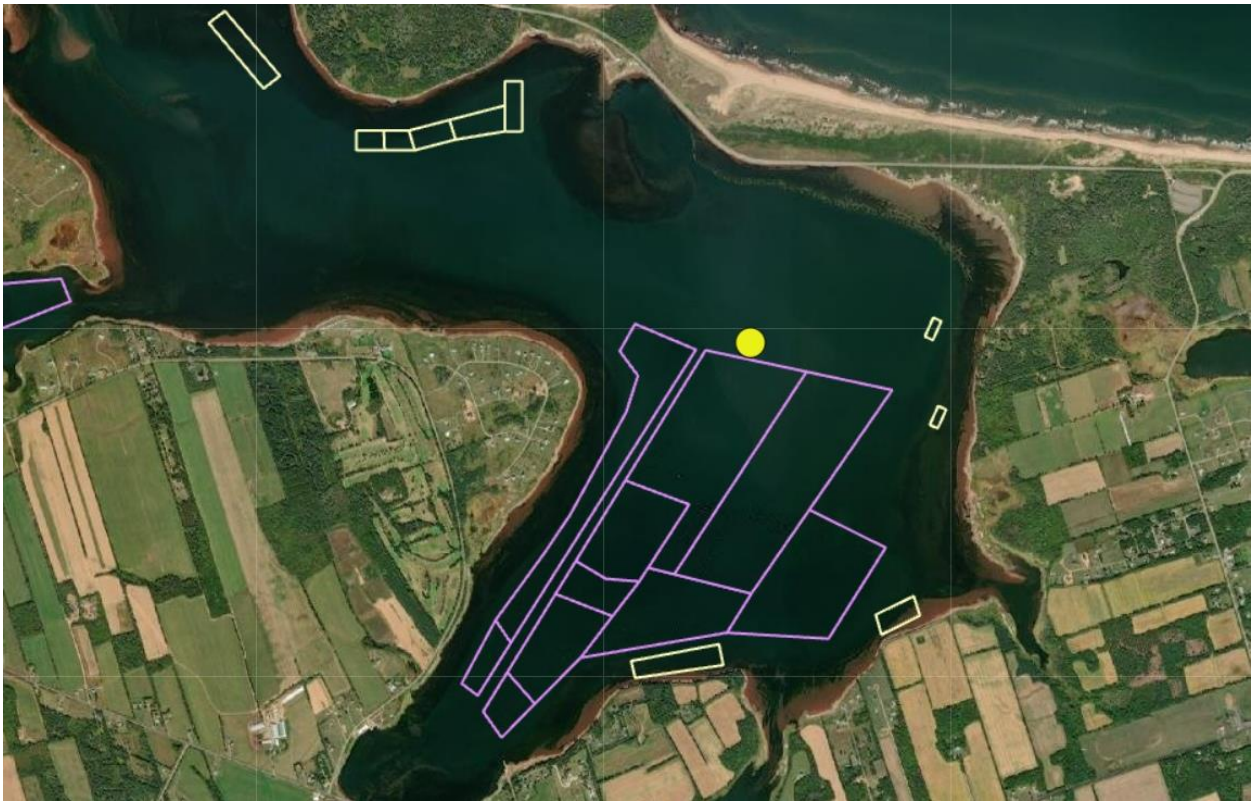
New London Mussel Monitoring Site

Nine Mile Creek Mussel Monitoring Site

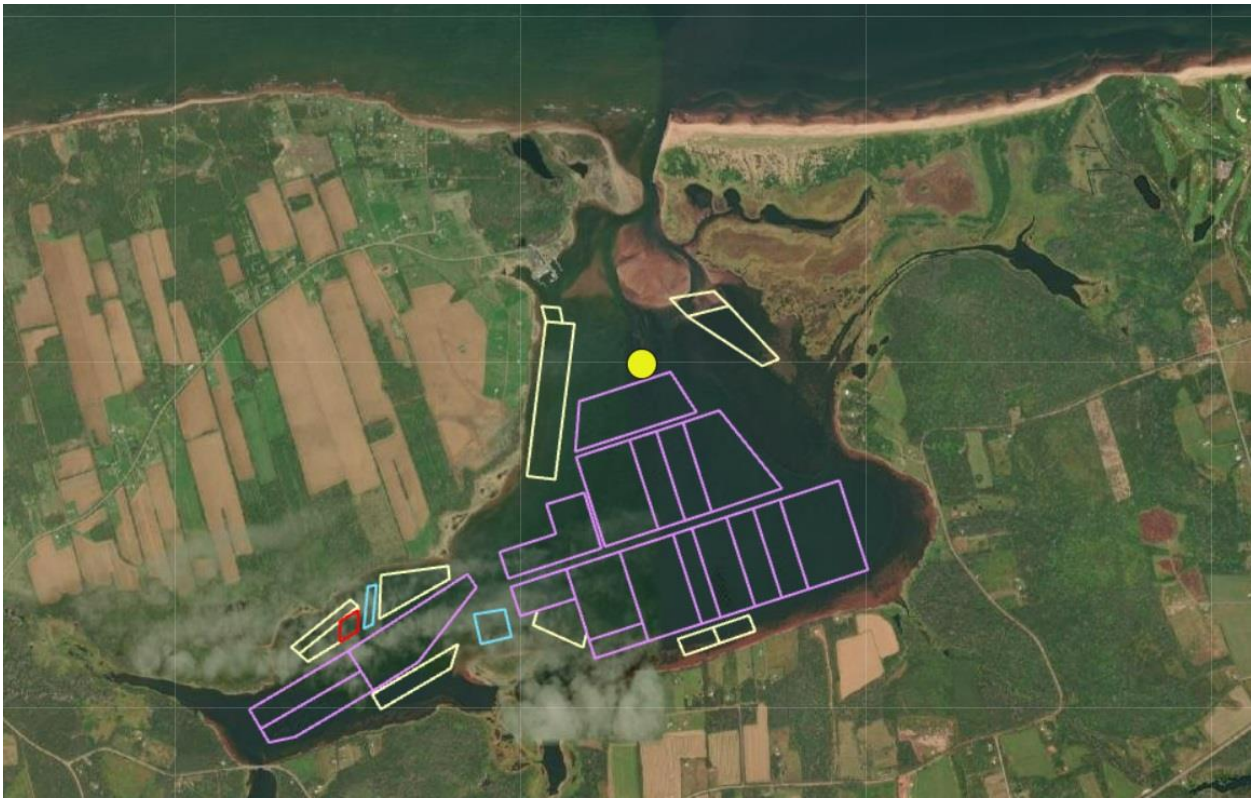


North Lake Mussel Monitoring Site

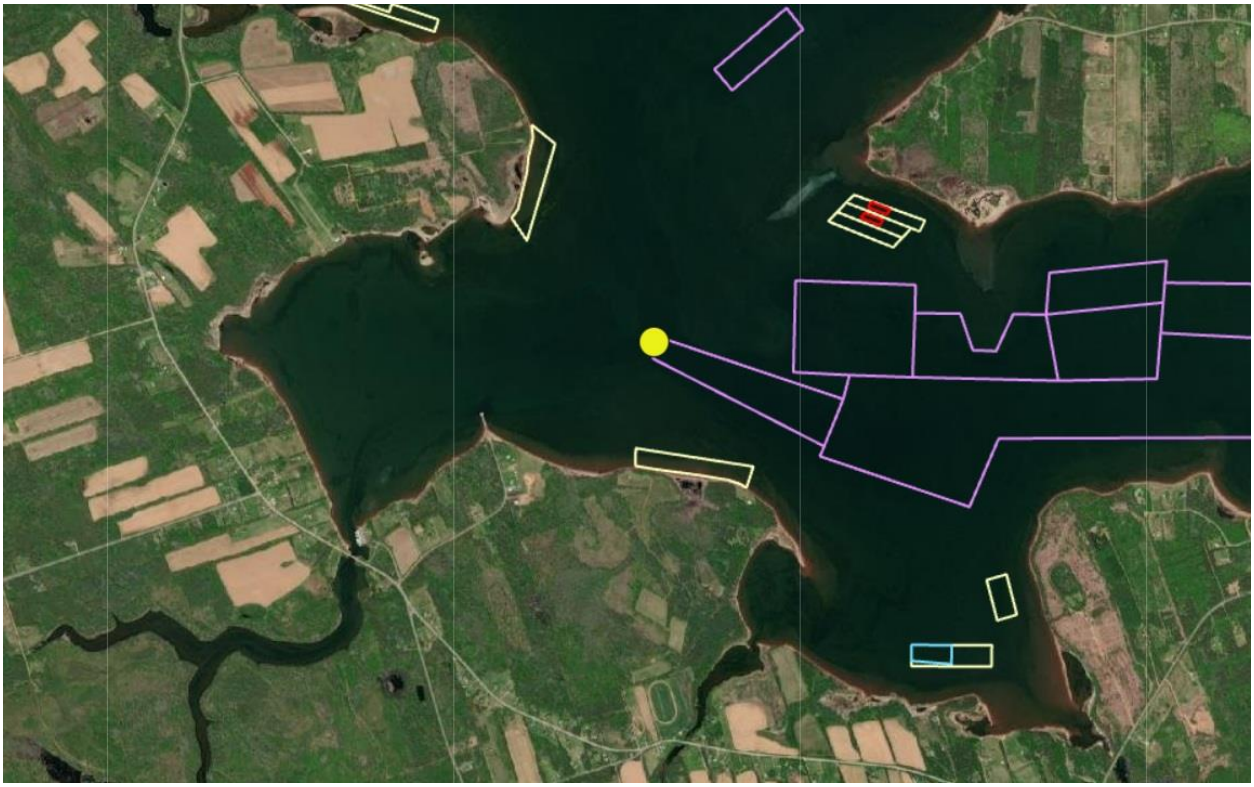
Orwell Bay Mussel Monitoring Site



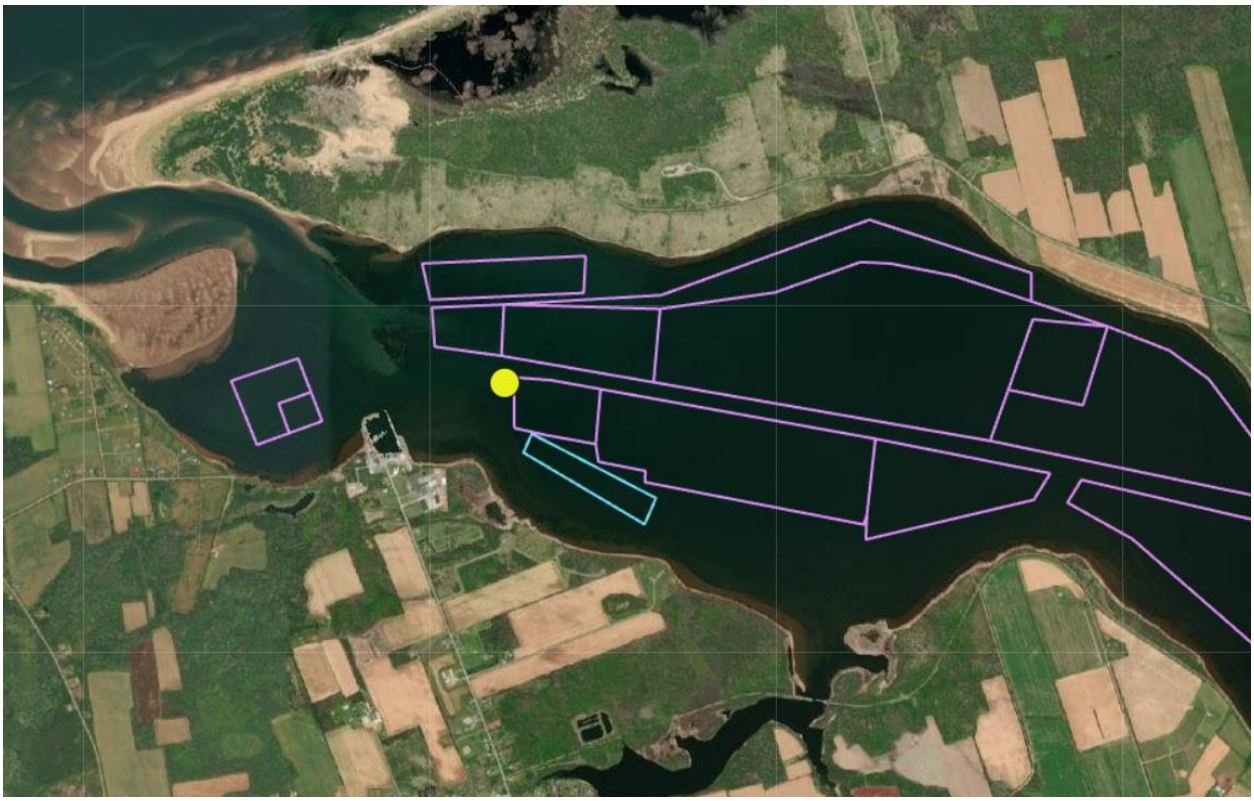
Rustico Bay Mussel Monitoring Site



Savage Harbour Mussel Monitoring Site



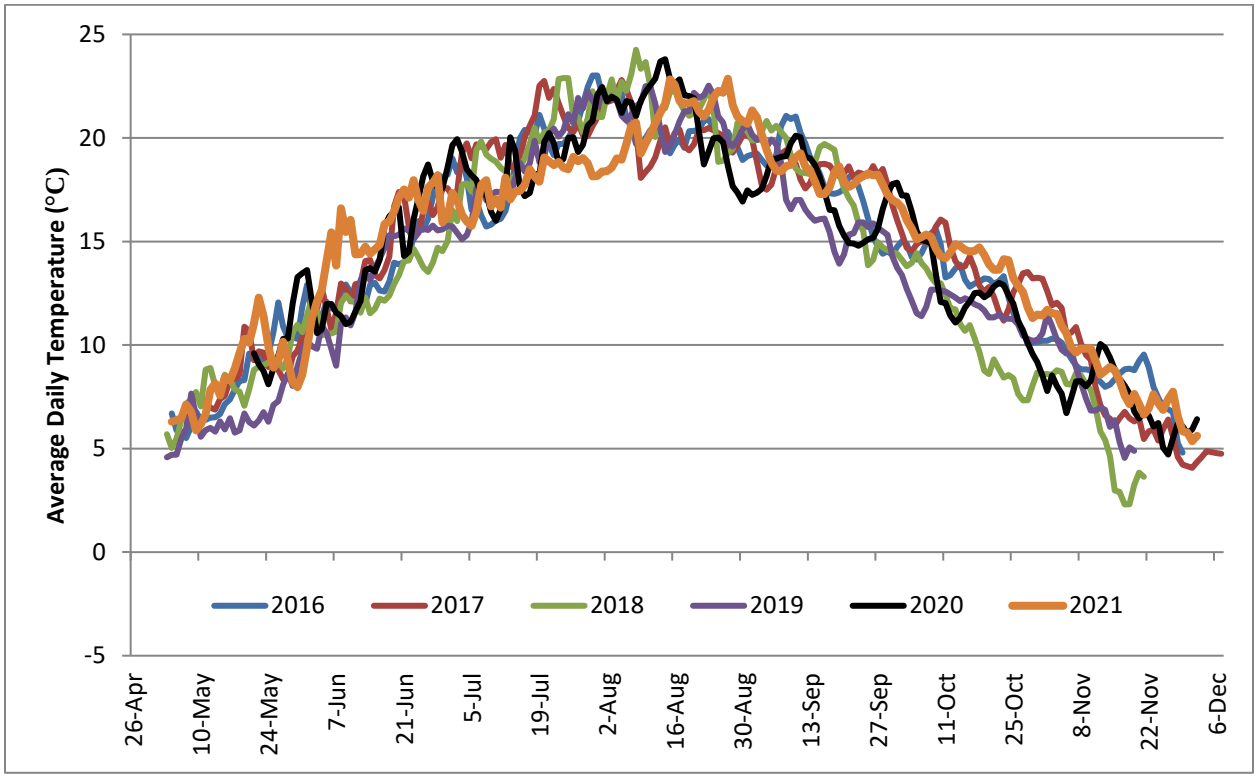
St. Mary's Bay Mussel Monitoring Site



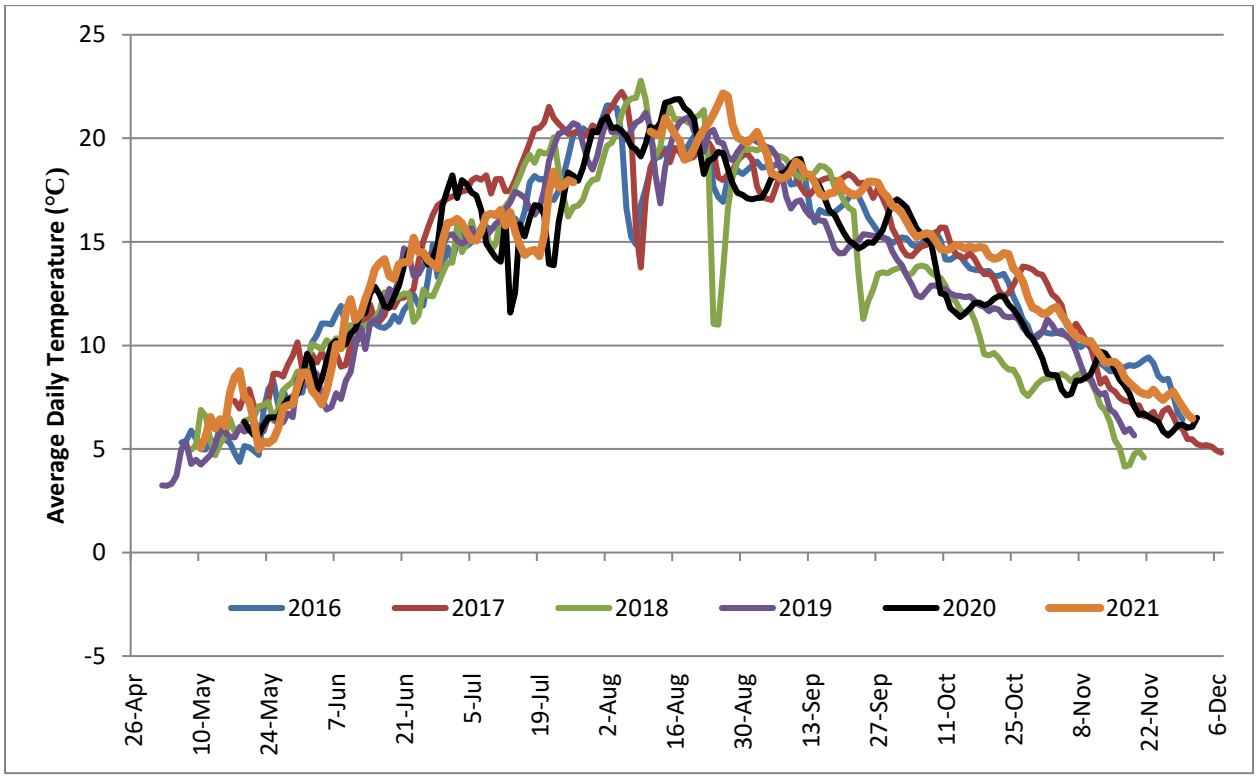
St. Peter's Bay Mussel Monitoring Site

Tracadie Bay and Winter Bay Mussel Monitoring Sites

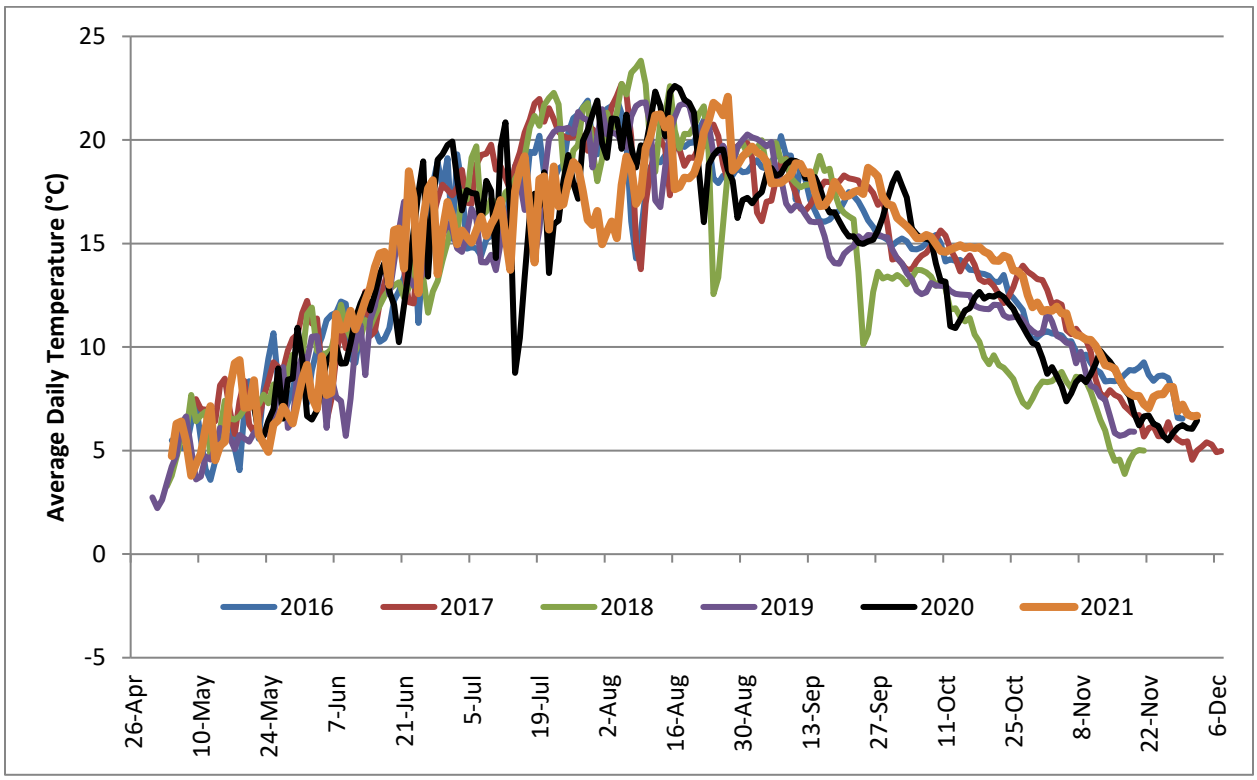
APPENDIX III WATER TEMPERATURE GRAPHS FOR SAMPLE SITES



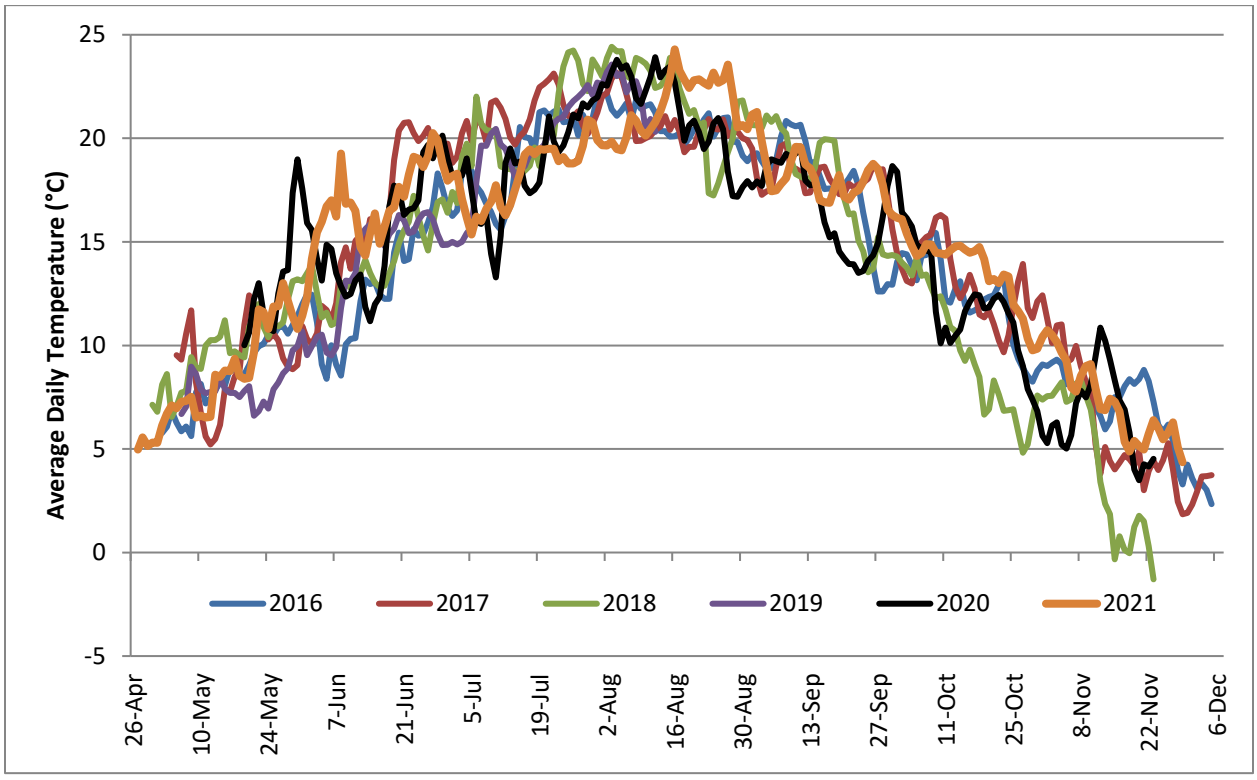
Average daily water temperature measured at Boughton River Mussel Monitoring Station in 2016 – 2021.



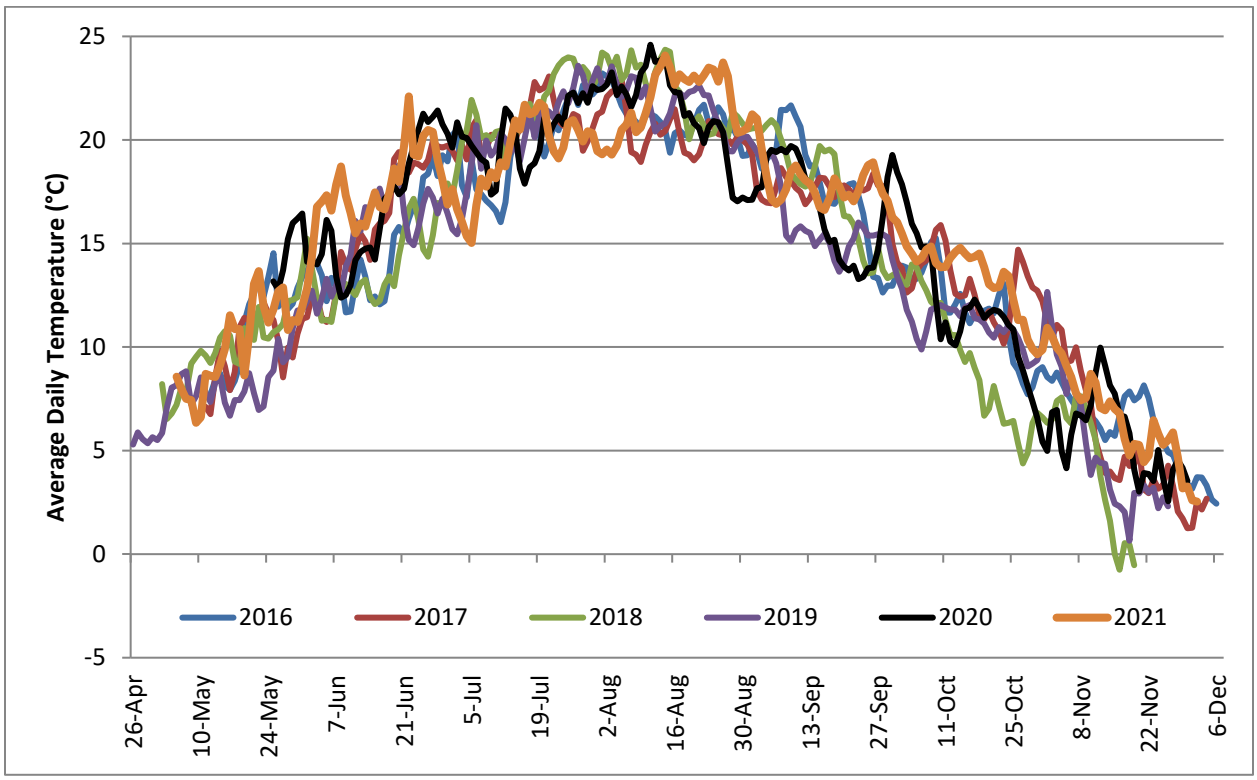
Average daily water temperature measured at Brudenell River Mussel Monitoring Station in 2016 – 2021.



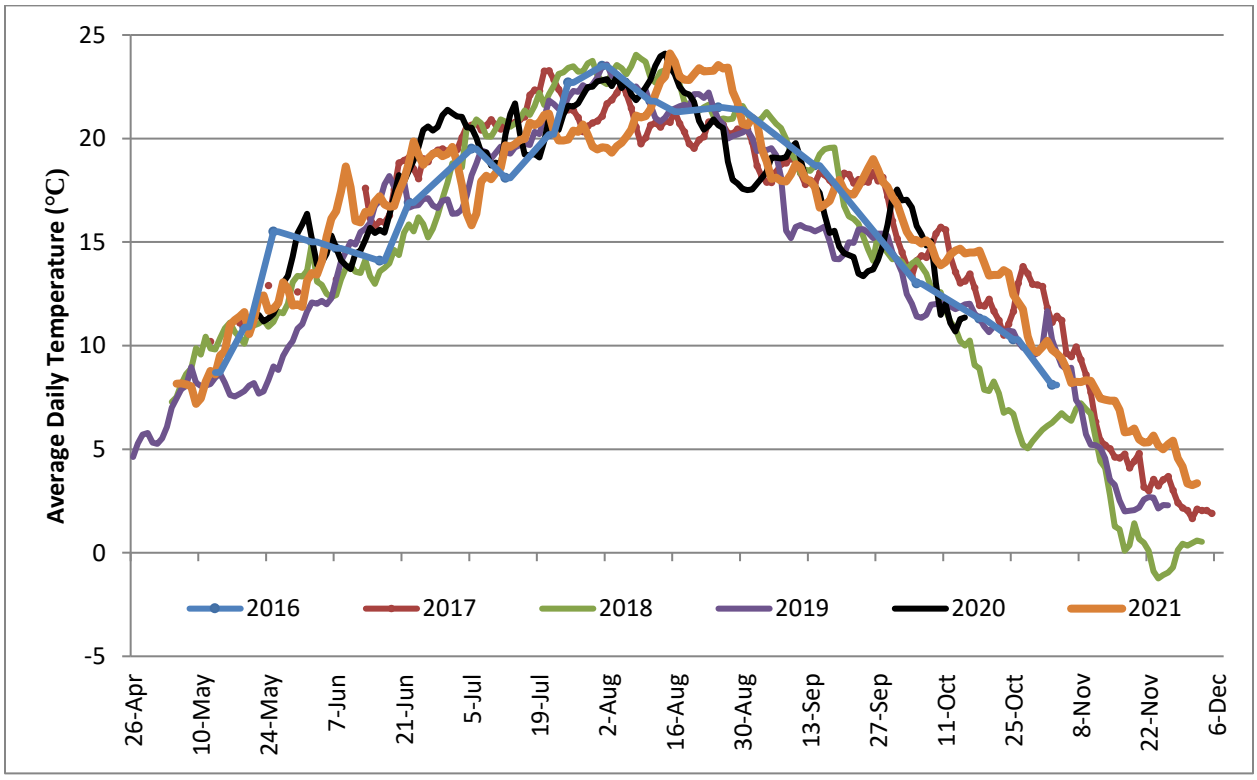
Average daily water temperature measured at Cardigan River Mussel Monitoring Station in 2016 – 2021.



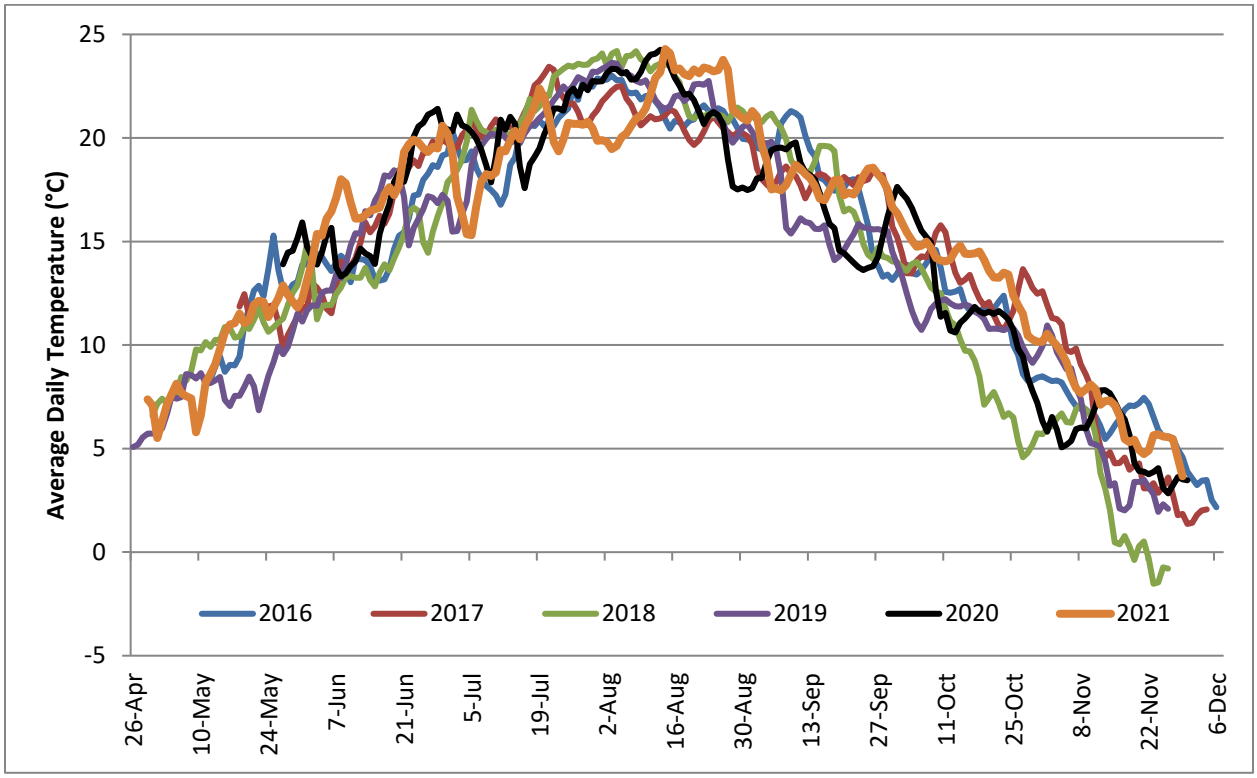
Average daily water temperature measured at Covehead Bay Mussel Monitoring Station in 2016 – 2021.



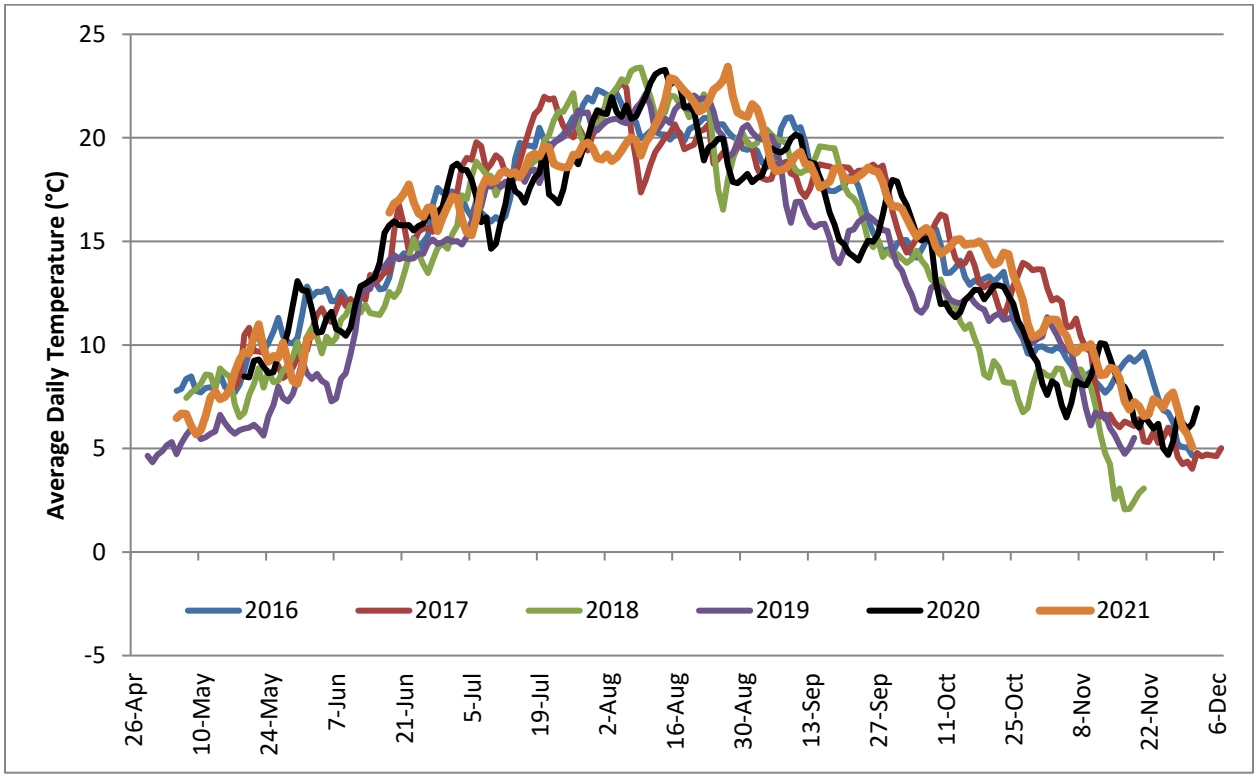
Average daily water temperature measured at Darnley Basin Mussel Monitoring Station in 2016 – 2021.



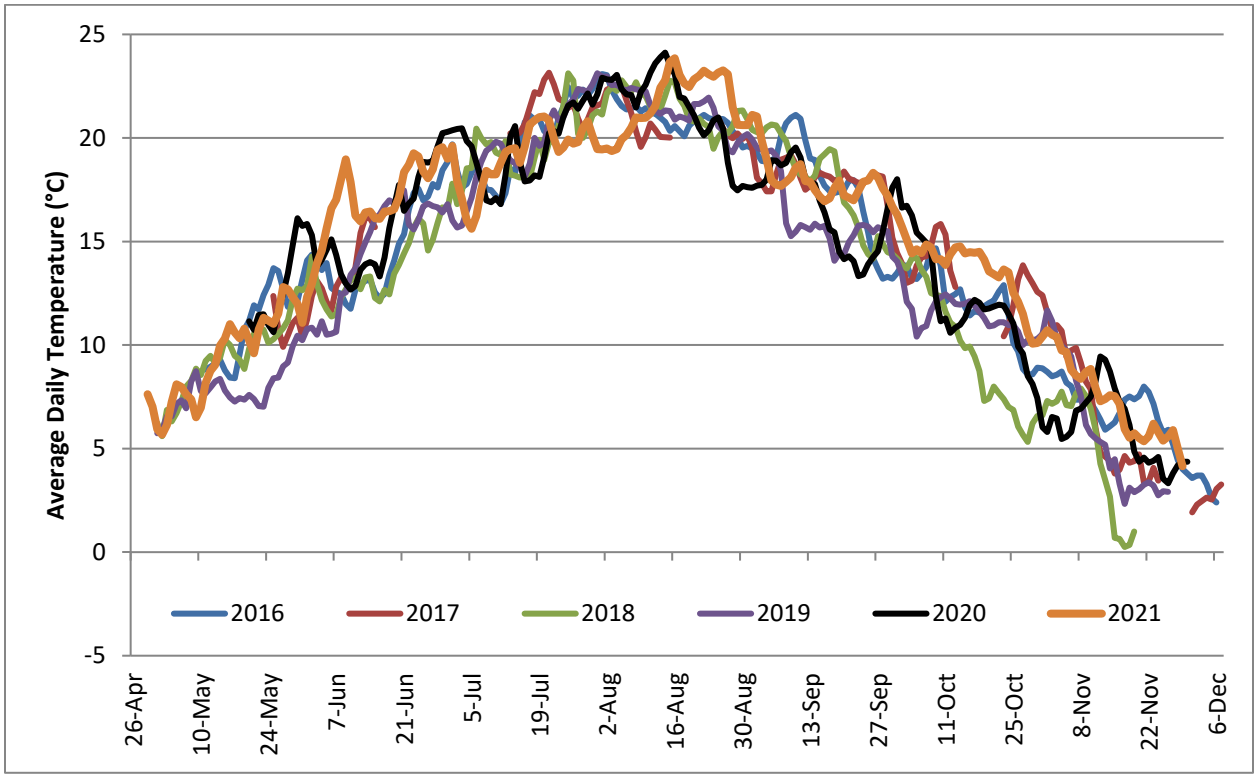
Average daily water temperature measured at Lennox Channel Mussel Monitoring Station in 2016 – 2021.



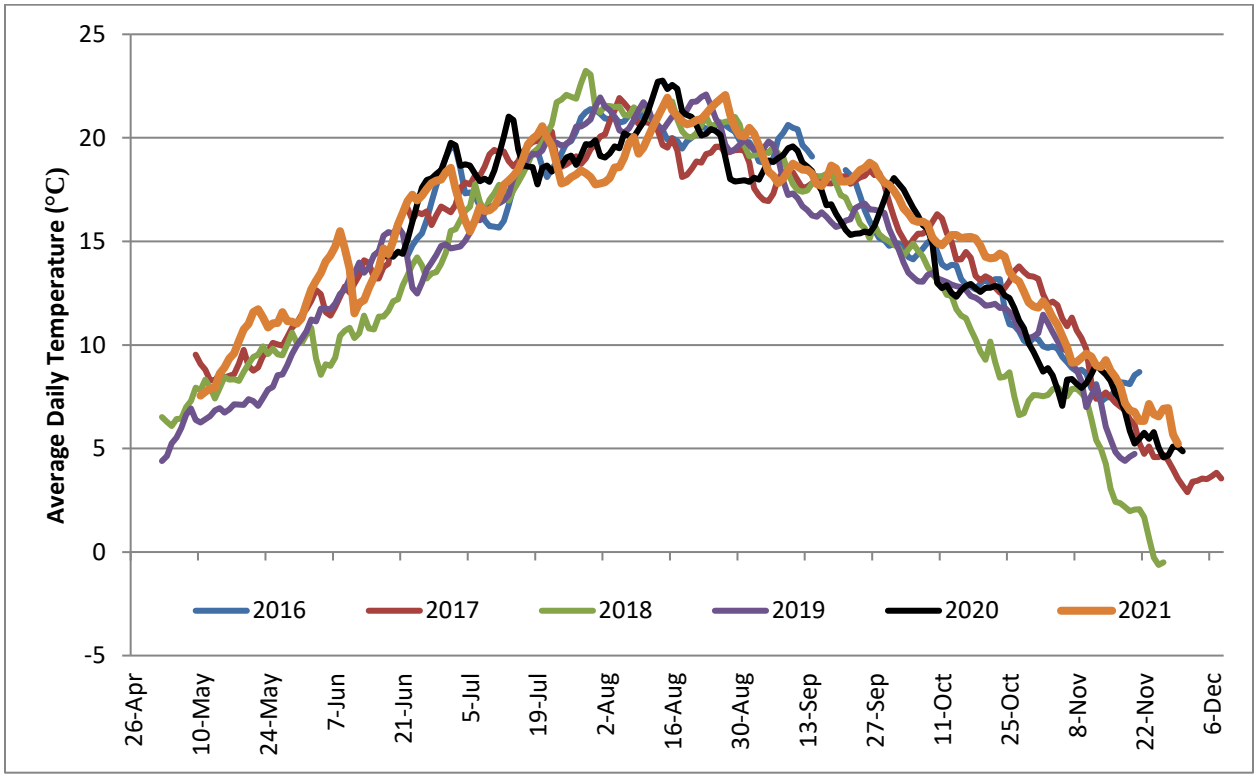
Average daily water temperature measured at March Water Mussel Monitoring Station in 2016 – 2021.



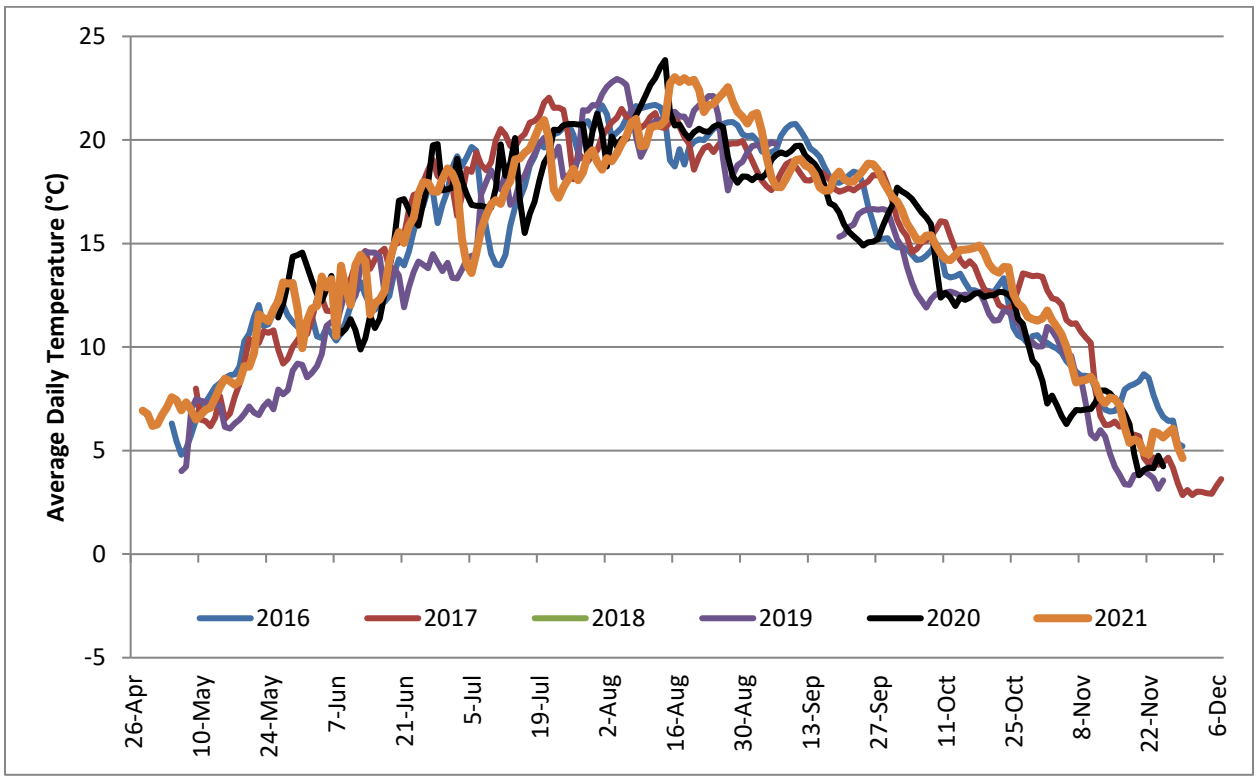
Average daily water temperature measured at Murray River Mussel Monitoring Station in 2016 – 2021.



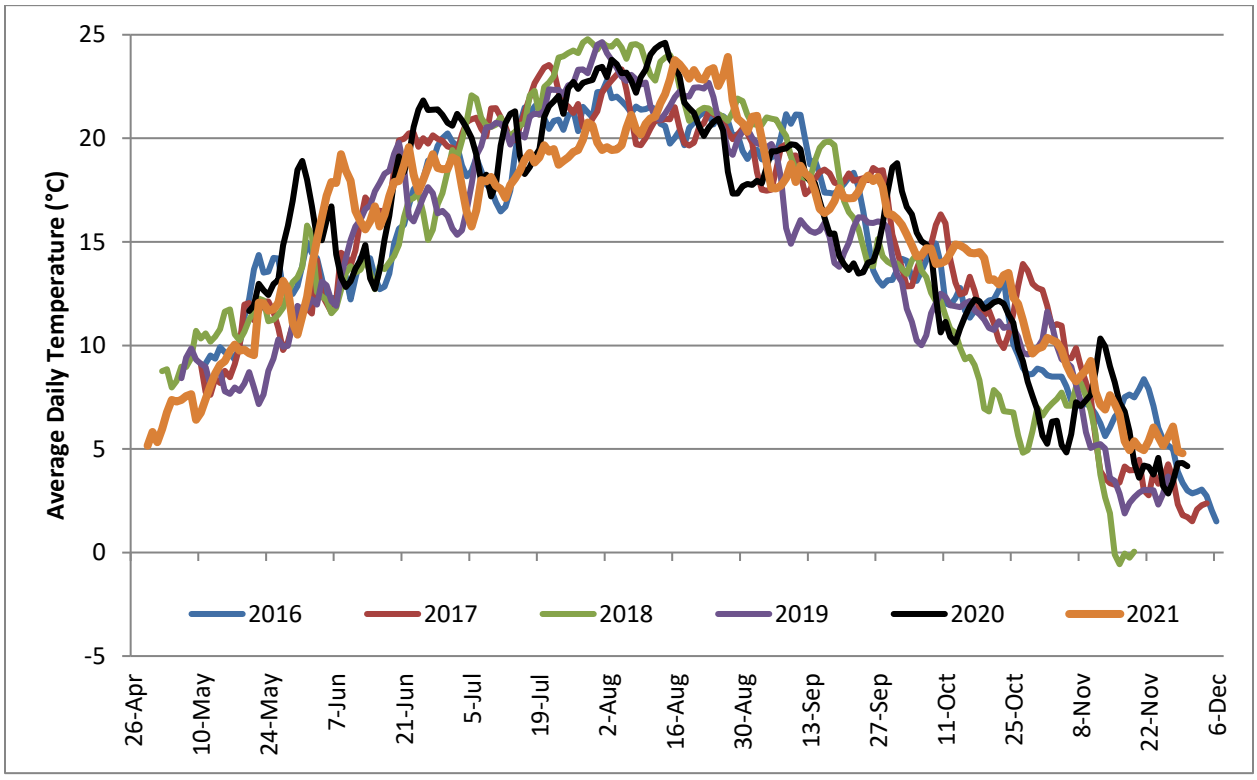
Average daily water temperature measured at New London Bay Mussel Monitoring Station in 2016 – 2021.



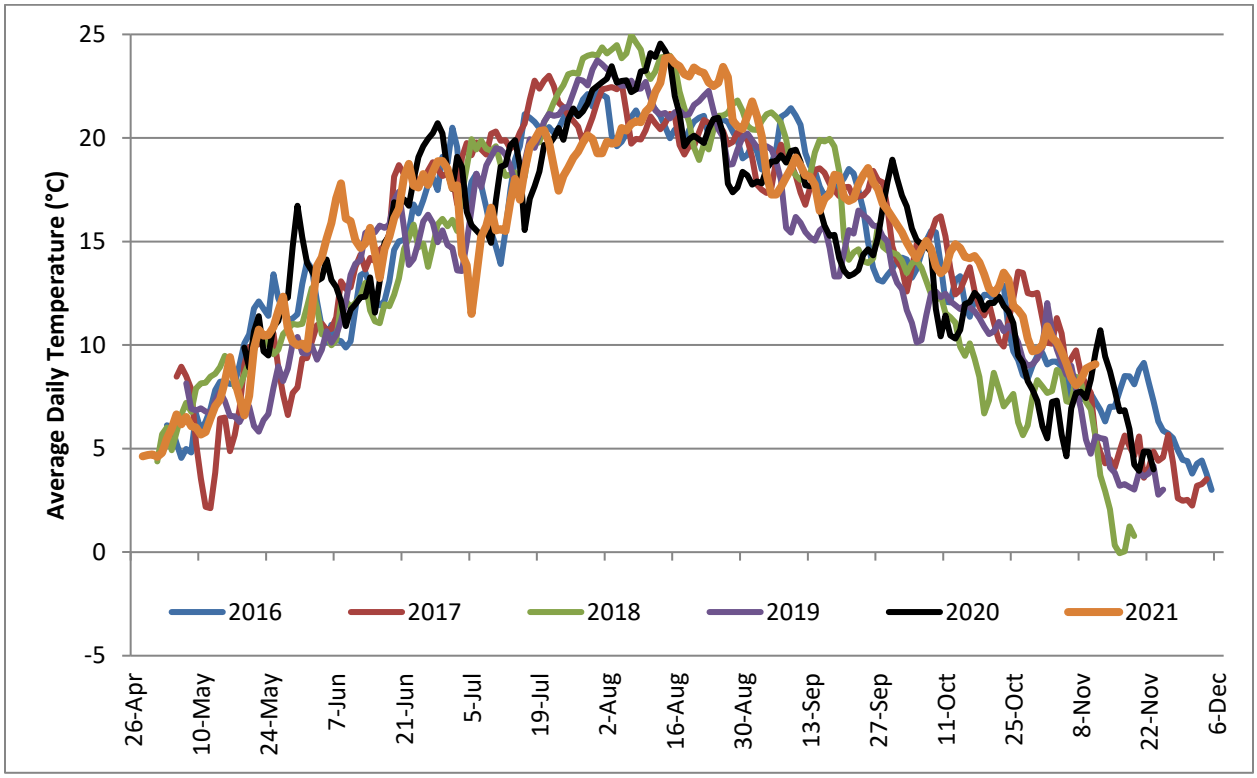
Average daily water temperature measured at Nine Mile Creek Mussel Monitoring Station in 2016 – 2021.



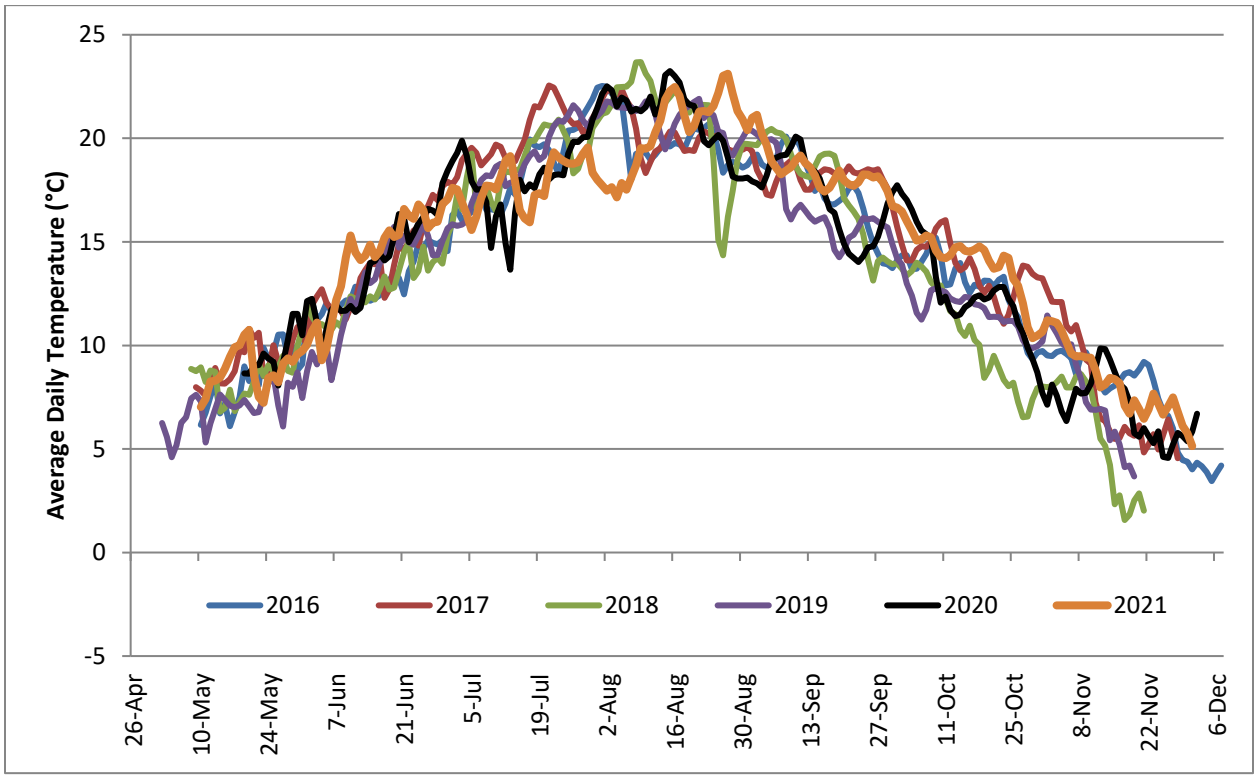
Average daily water temperature measured at Orwell Bay Mussel Monitoring Station in 2016 – 2021.



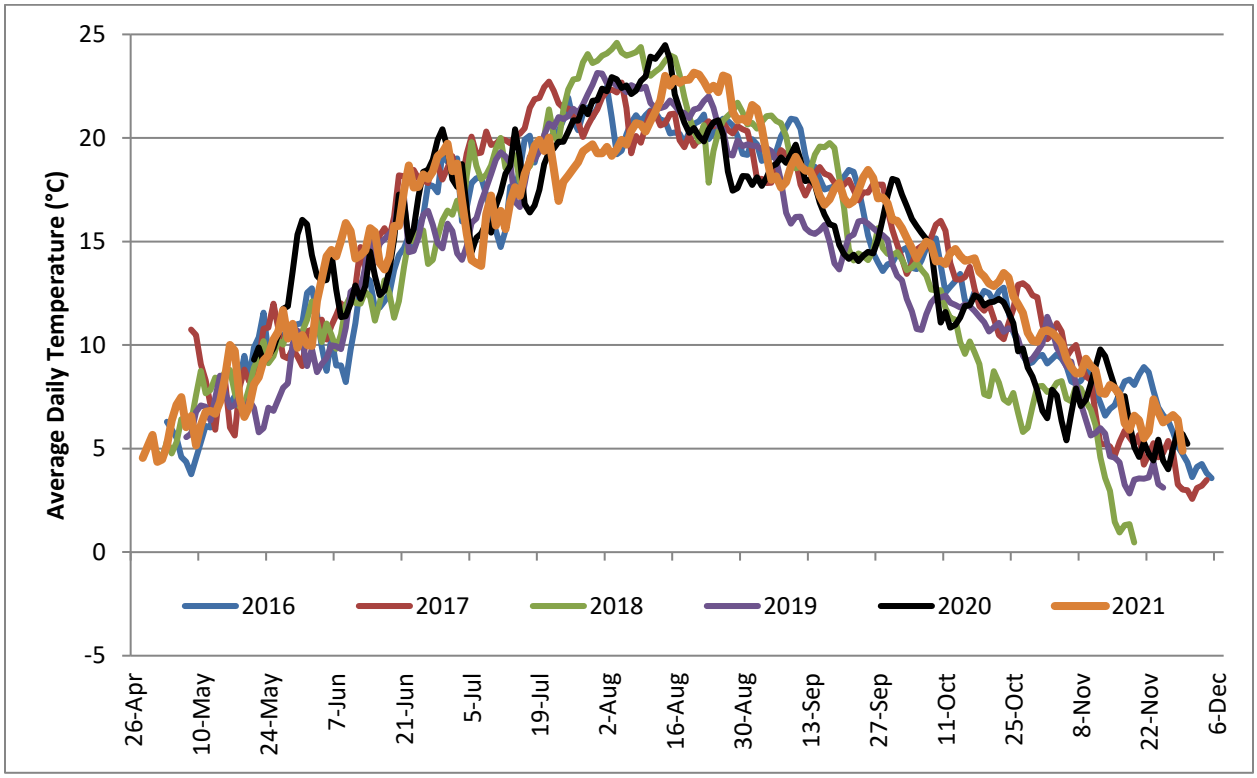
Average daily water temperature measured at Rustico Bay Mussel Monitoring Station in 2016 – 2021.



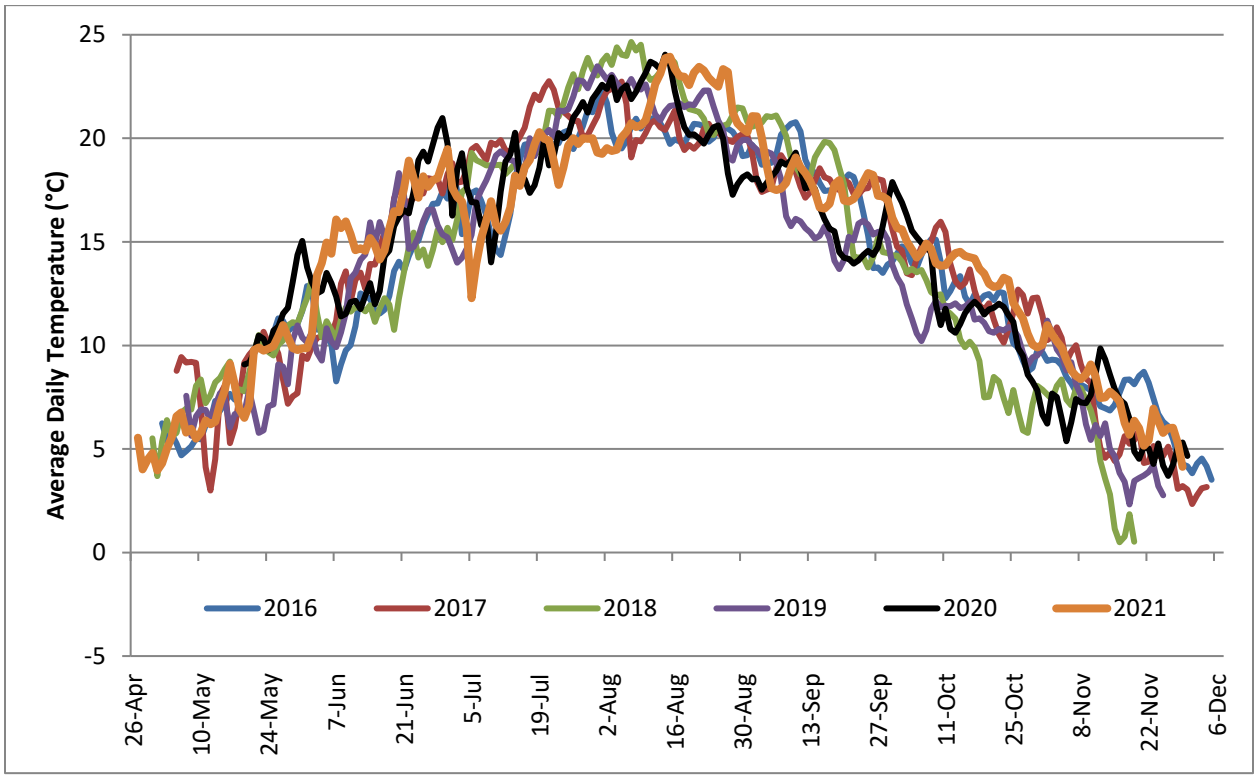
Average daily water temperature measured at Savage Harbour Mussel Monitoring Station in 2016 – 2021.



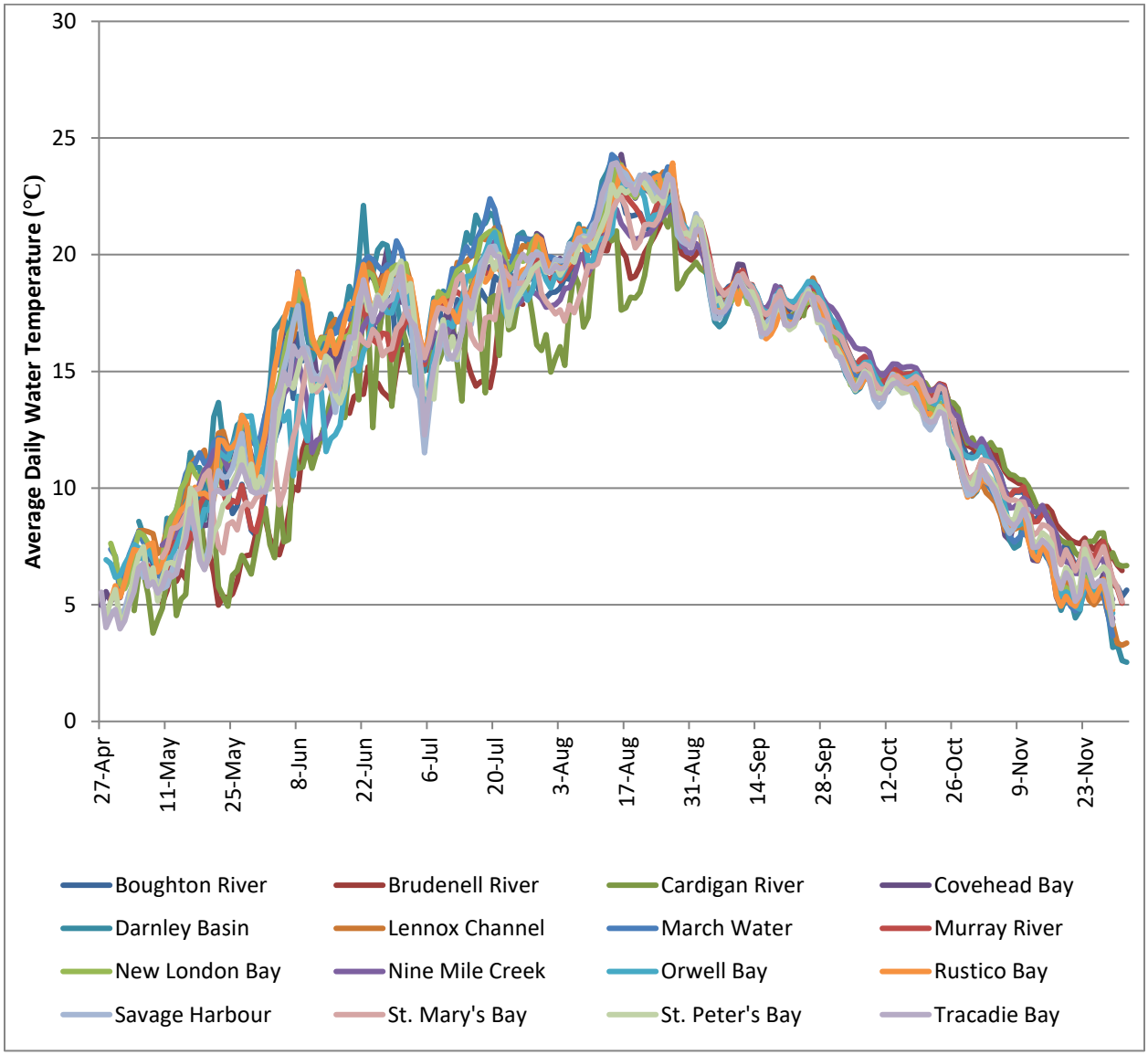
Average daily water temperature measured at St. Mary's Bay Mussel Monitoring Station in 2016 – 2021.



Average daily water temperature measured at St. Peter's Bay Mussel Monitoring Station in 2016 – 2021.



Average daily water temperature measured at Tracadie Bay Mussel Monitoring Station in 2016 – 2021.



Average daily water temperature measured at all Mussel Monitoring Sites in 2021.

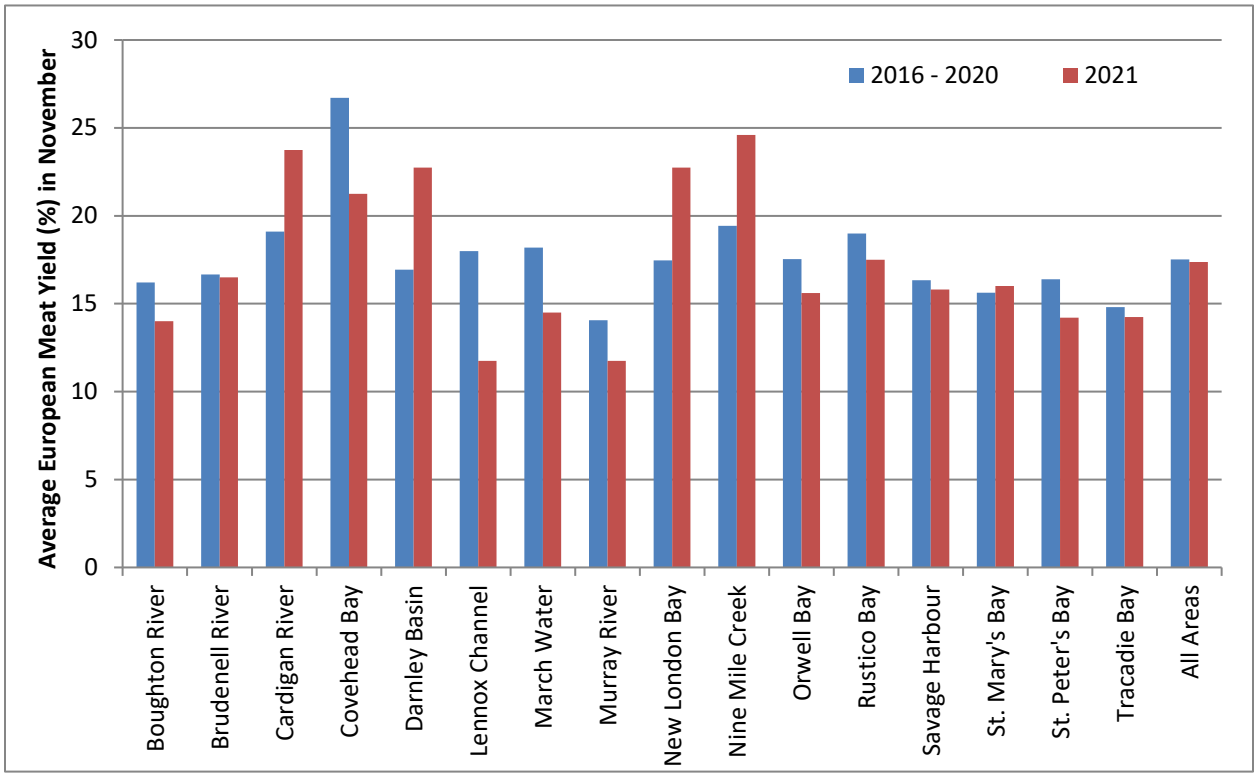
APPENDIX IV MUSSEL STEAMED MEAT YIELD INFORMATION

Comparison of average steamed meat yields from mussels collected from 16 Mussel Monitoring sites in 2017, 2018, 2019, 2020 and 2021.

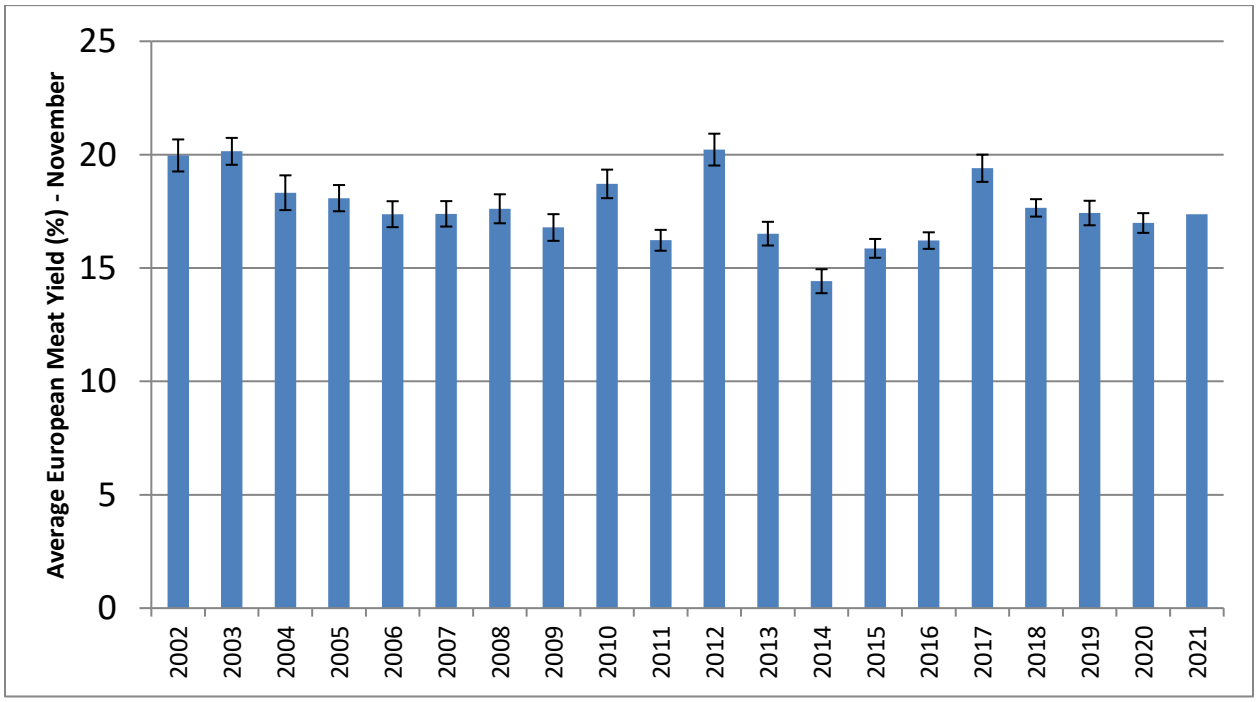
Area	2017	2018	2019	2020	2021
Boughton River	35.4	35.3	38.6	30.0	32.3
Brudenell River	39.4	39.1	40.5	36.9	35.2
Cardigan River	37.9	37.3	36.7	32.6	40.1
Covehead Bay	43.3	39.8	40.8	40.7	40.8
Darnley Basin	33.6	31.3	33.9	32.3	36.0
Lennox Channel	31.3	31.4	33.7	30.7	30.0
March Water	28.4	32.4	33.7	30.5	29.3
Murray River	29.5	32.7	32.6	28.9	29.8
New London Bay	37.9	37.2	38.2	32.7	38.1
Nine Mile Creek	38.7	36.8	37.2	33.7	38.0
Orwell Bay	34.7	35.9	35.5	33.4	29.4
Rustico Bay	38.5	38.4	39.6	36.1	39.8
Savage Harbour	30.3	34.1	31.7	28.6	28.4
St. Mary's Bay	34.0	33.1	34.7	33.7	32.2
St. Peter's Bay	34.1	34.2	35.4	30.1	33.9
Tracadie Bay	30.8	34.1	32.5	28.0	32.4

Comparison of average meat weight from mussels collected from 16 Mussel Monitoring Sites in 2021.

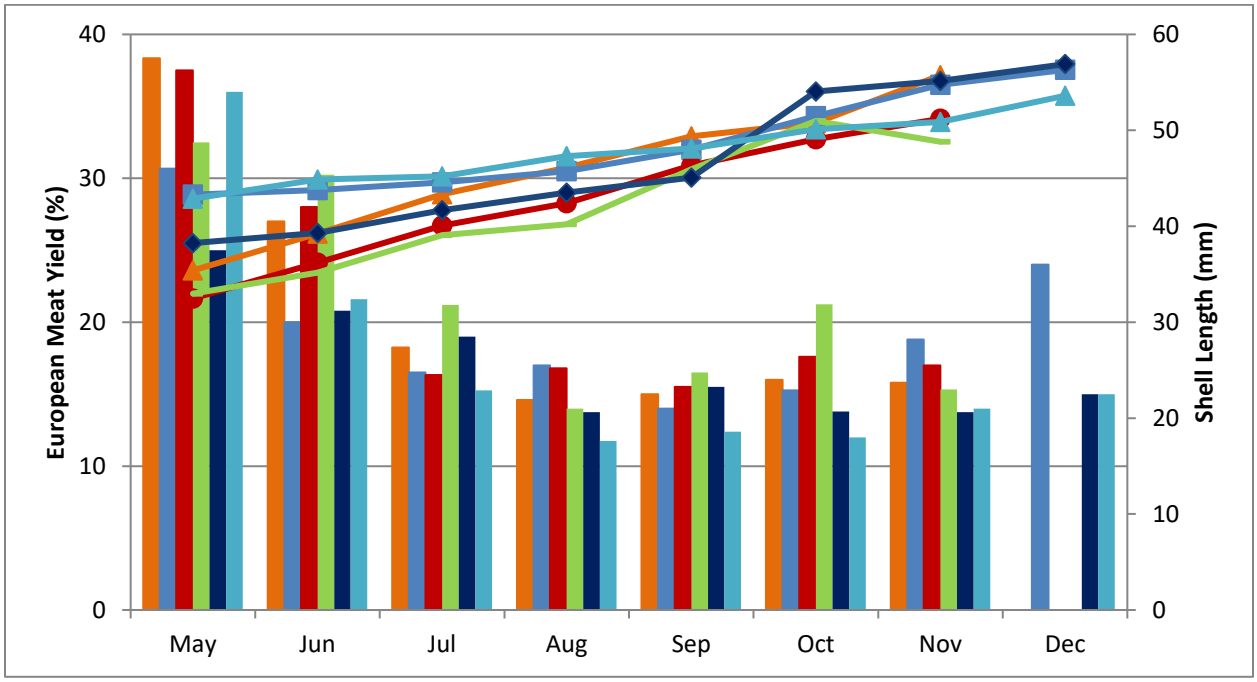
Area	Maximum (g)	Minimum (g)	Average (g)
Boughton River	2.9	1.1	1.7
Brudenell River	4.8	1.2	1.9
Cardigan River	4.3	0.7	2.1
Covehead Bay	3.7	1.7	2.5
Darnley Basin	3.2	0.6	1.4
Lennox Channel	1.6	0.7	1.9
March Water	1.6	0.6	1.0
Murray River	2.5	0.9	1.3
New London Bay	4.8	1.0	1.9
Nine Mile Creek	5.6	1.6	2.5
Orwell Bay	2.5	0.9	1.3
Rustico Bay	3.3	1.2	2.2
Savage Harbour	2.1	1.2	1.5
St. Mary's Bay	3.6	1.4	1.9
St. Peter's Bay	2.6	1.0	1.6
Tracadie Bay	2.2	0.9	1.3



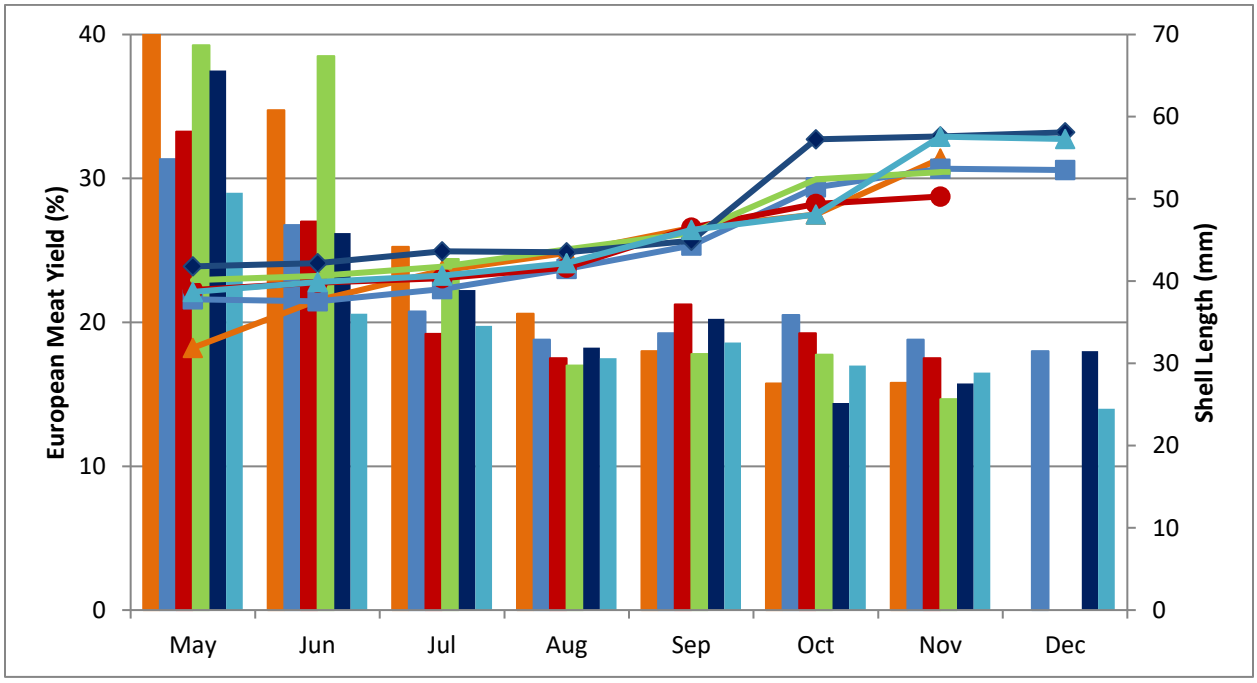
Average European meat yield (%) in November compared between a 5-year average (2016-2020) and 2021 for each of the MMP sites.



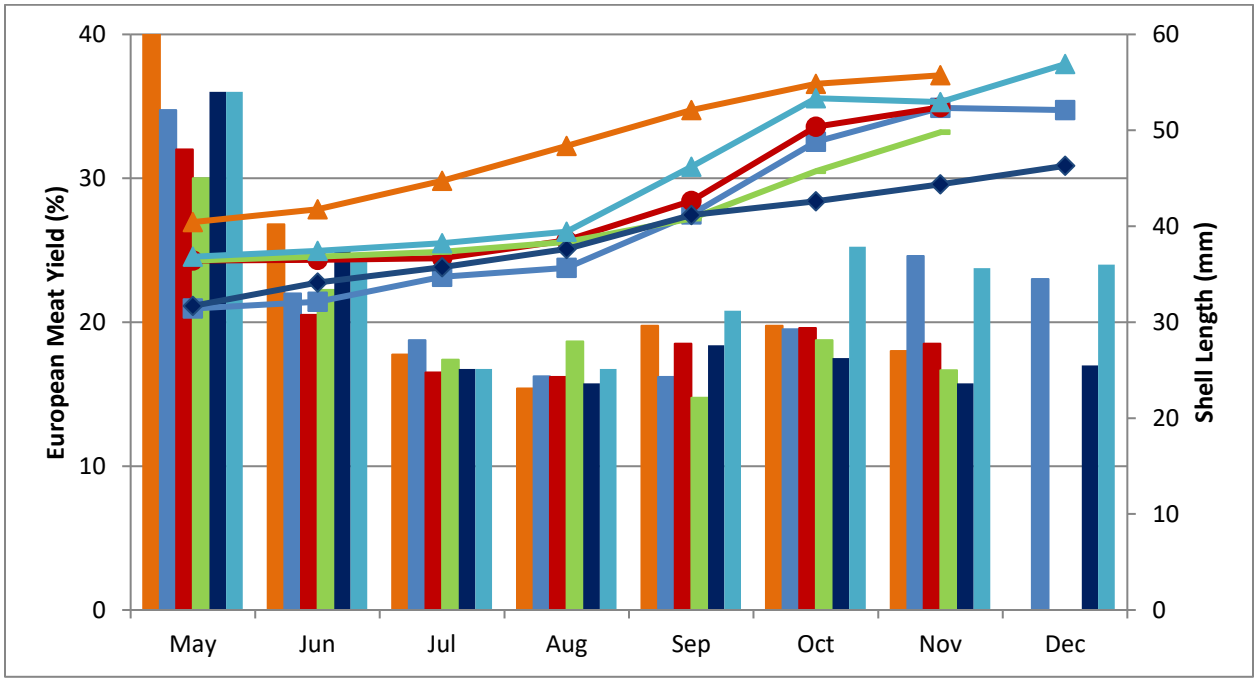
Annual Average European meat yield (%) in November for all MMP sites from 2002-2021.



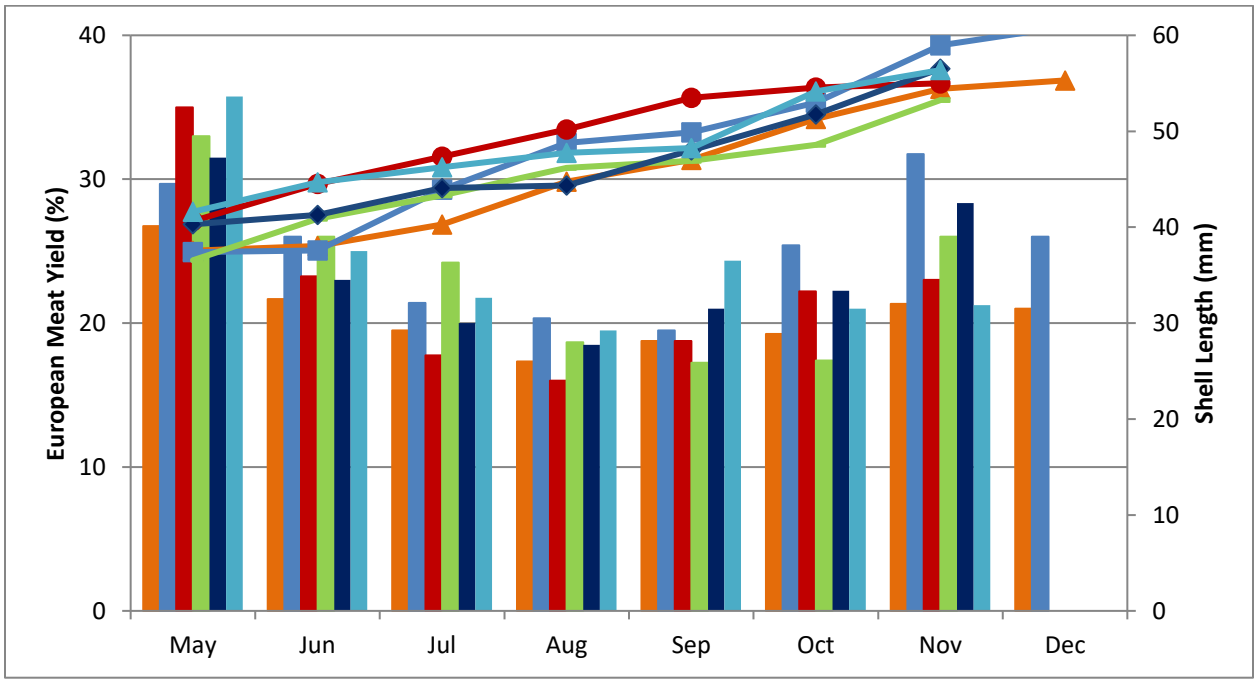
Boughton River European Meat Yield and Shell Length, 2016-2021.



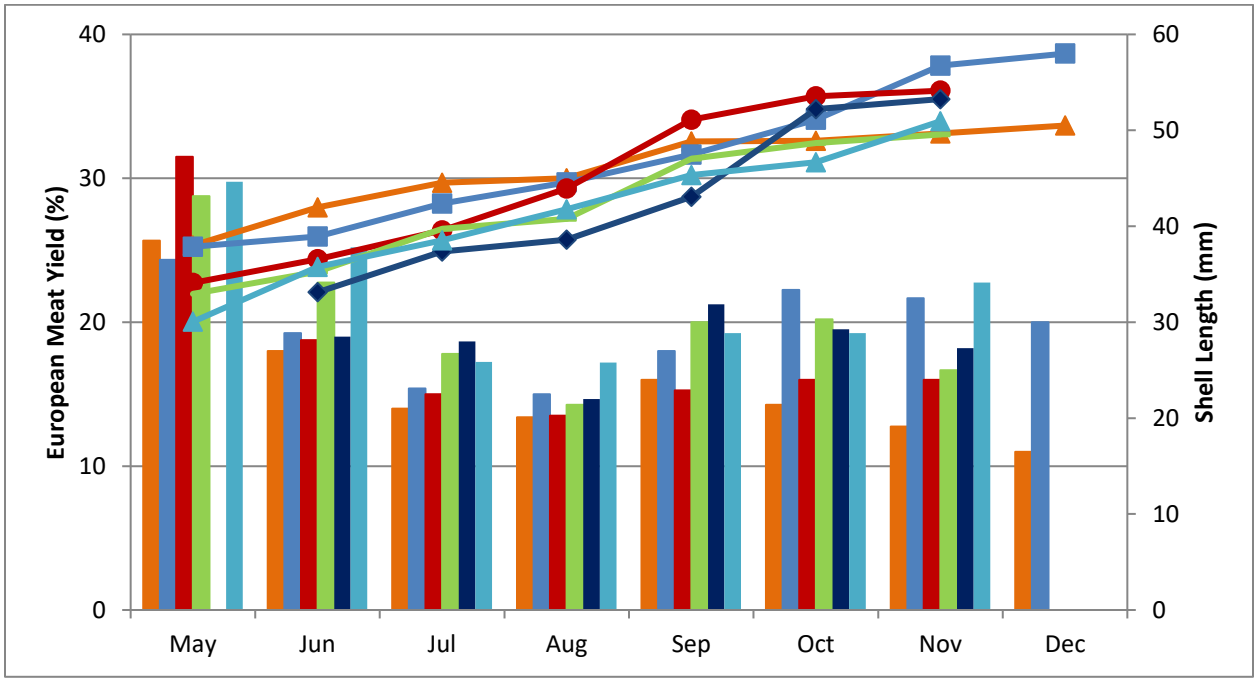
Brudenell River European Meat Yield and Shell Length, 2016-2021.



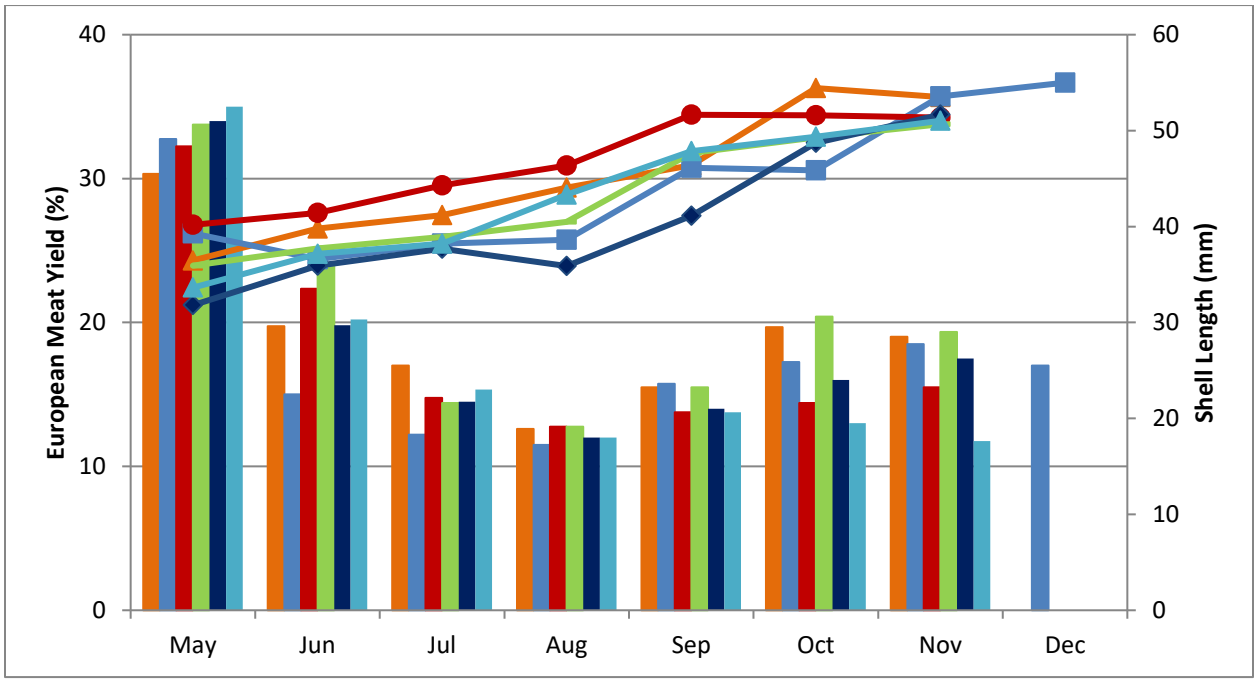
Cardigan River European Meat Yield and Shell Length, 2016-2021.



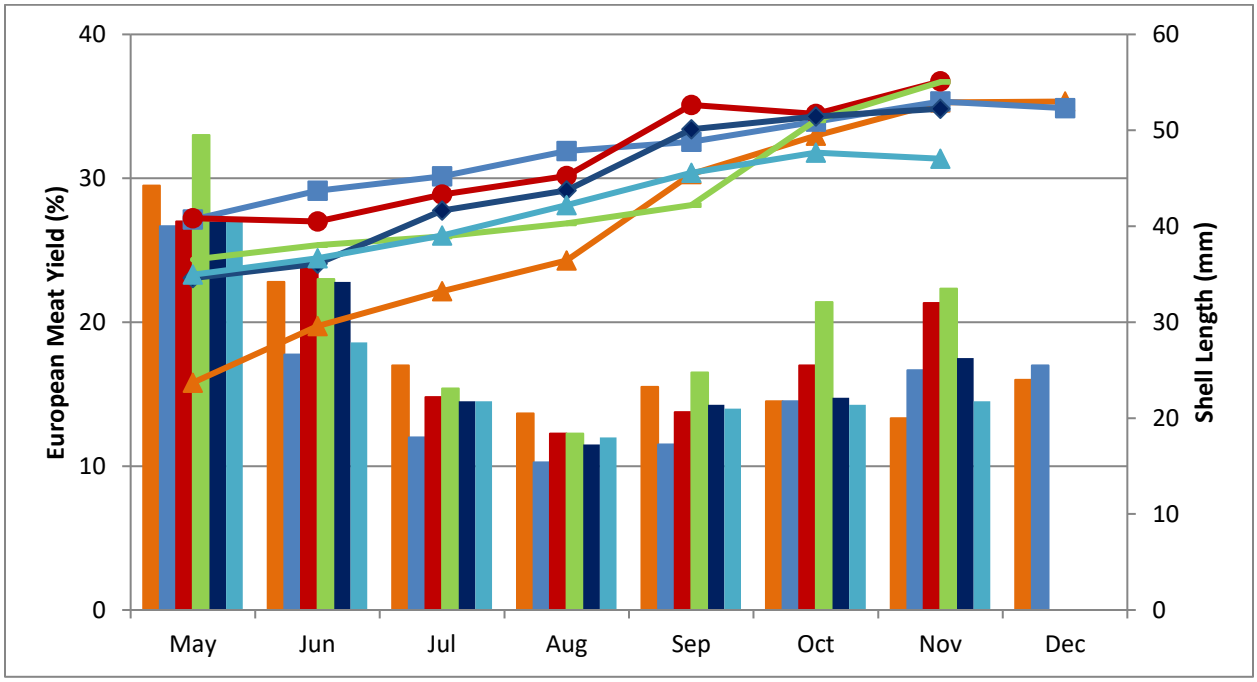
Covehead Bay European Meat Yield and Shell Length, 2016-2021.



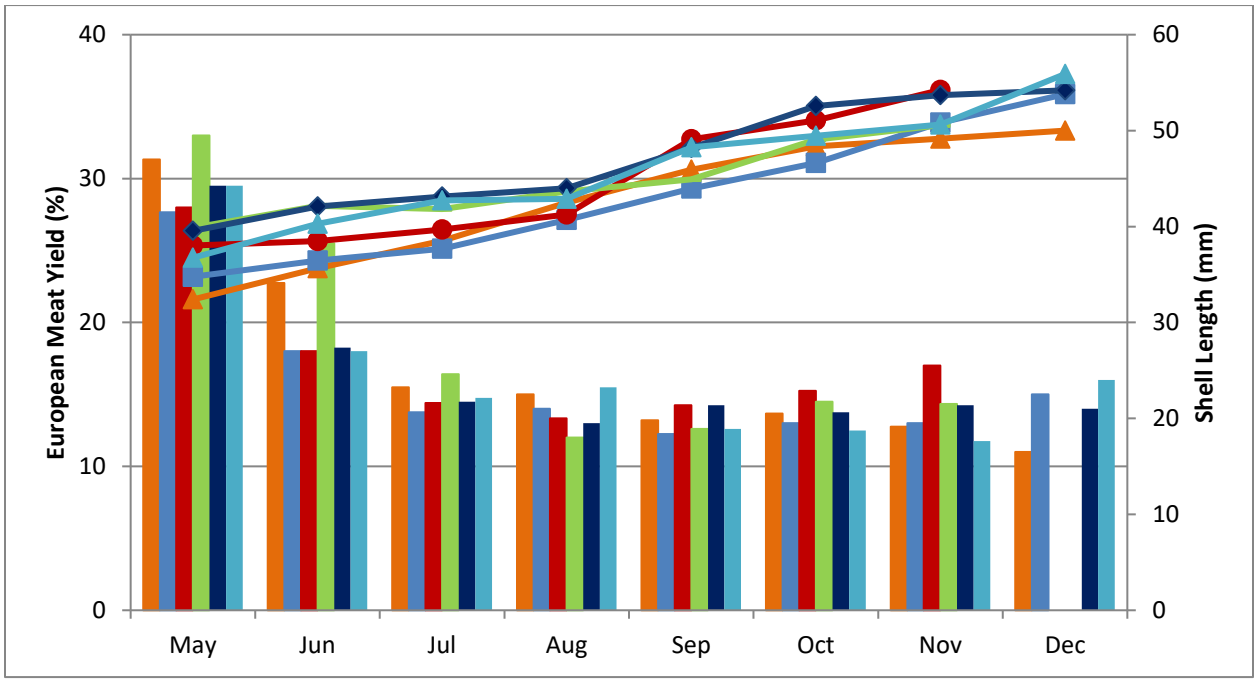
Darnley Basin European Meat Yield and Shell Length, 2016-2021.



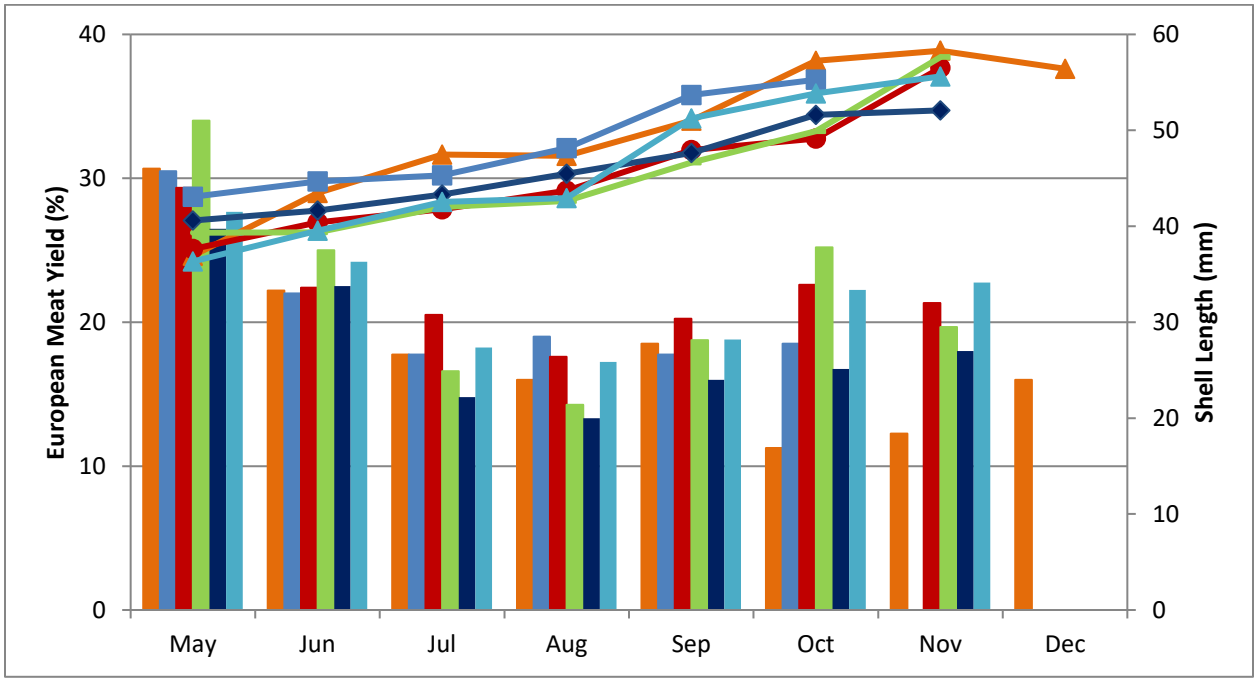
Lennox Channel European Meat Yield and Shell Length, 2016-2020.



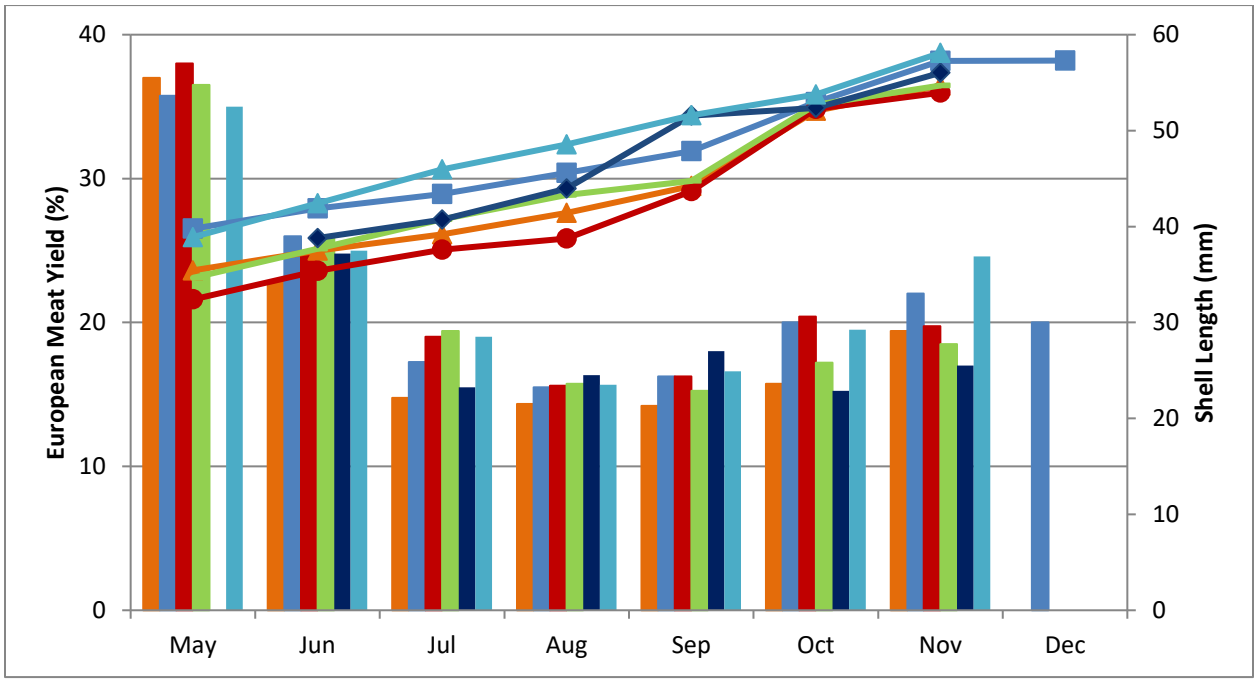
March Water European Meat Yield and Shell Length, 2016-2021.



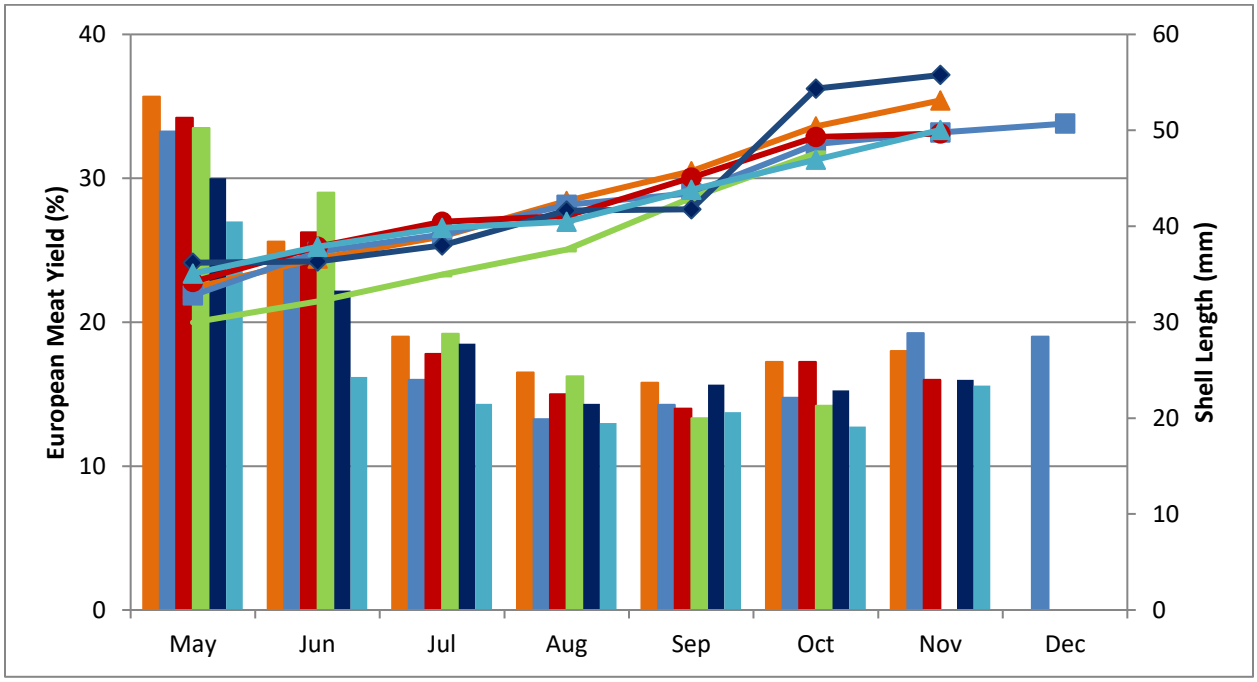
Murray River European Meat Yield and Shell Length, 2016-2021.



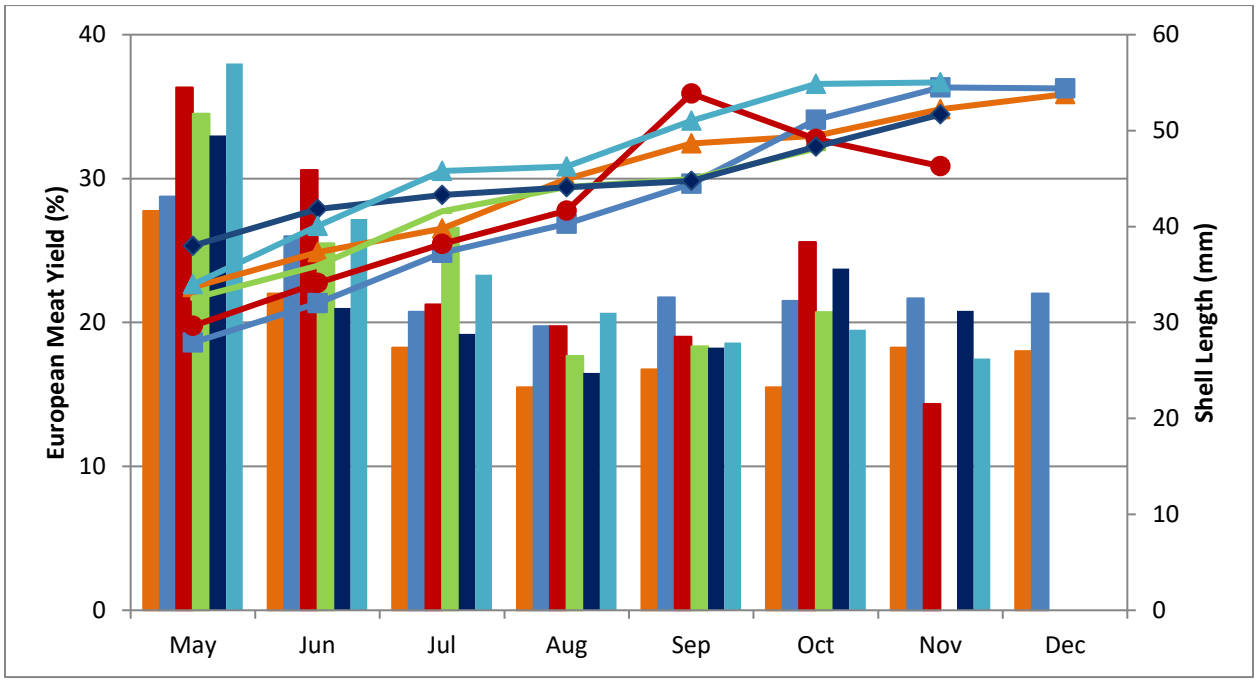
New London Bay European Meat Yield and Shell Length, 2016-2021.



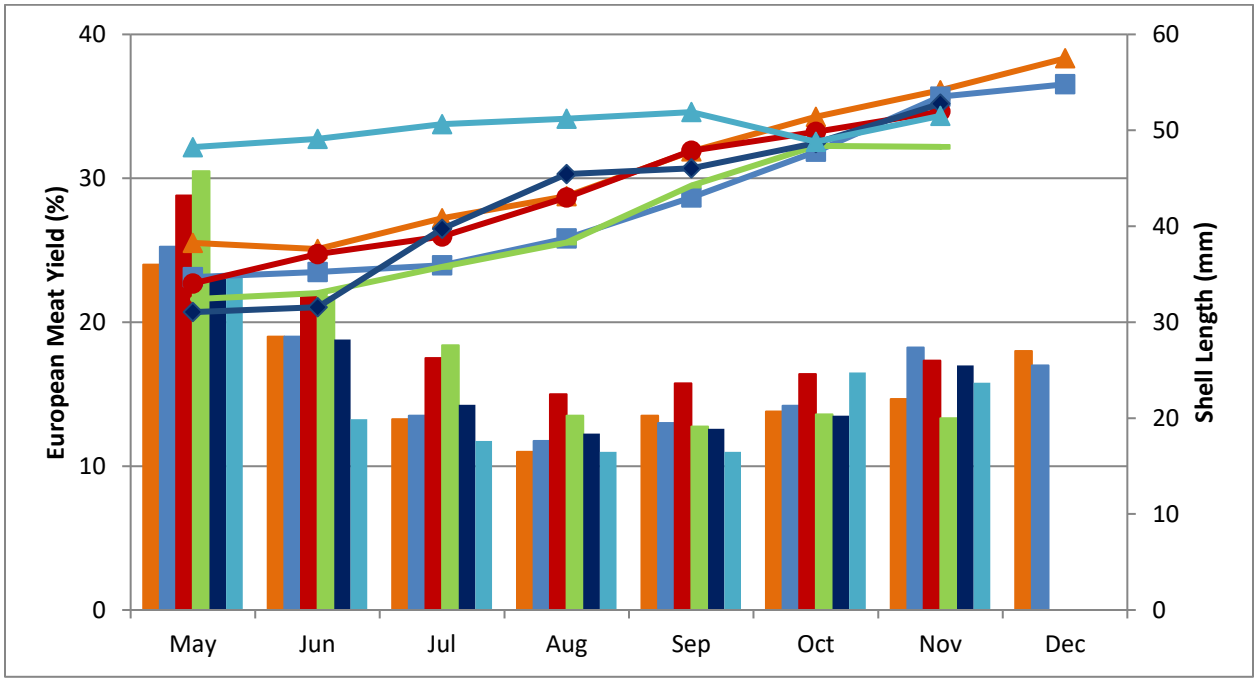
Nine Mile Creek European Meat Yield and Shell Length, 2016-2021.



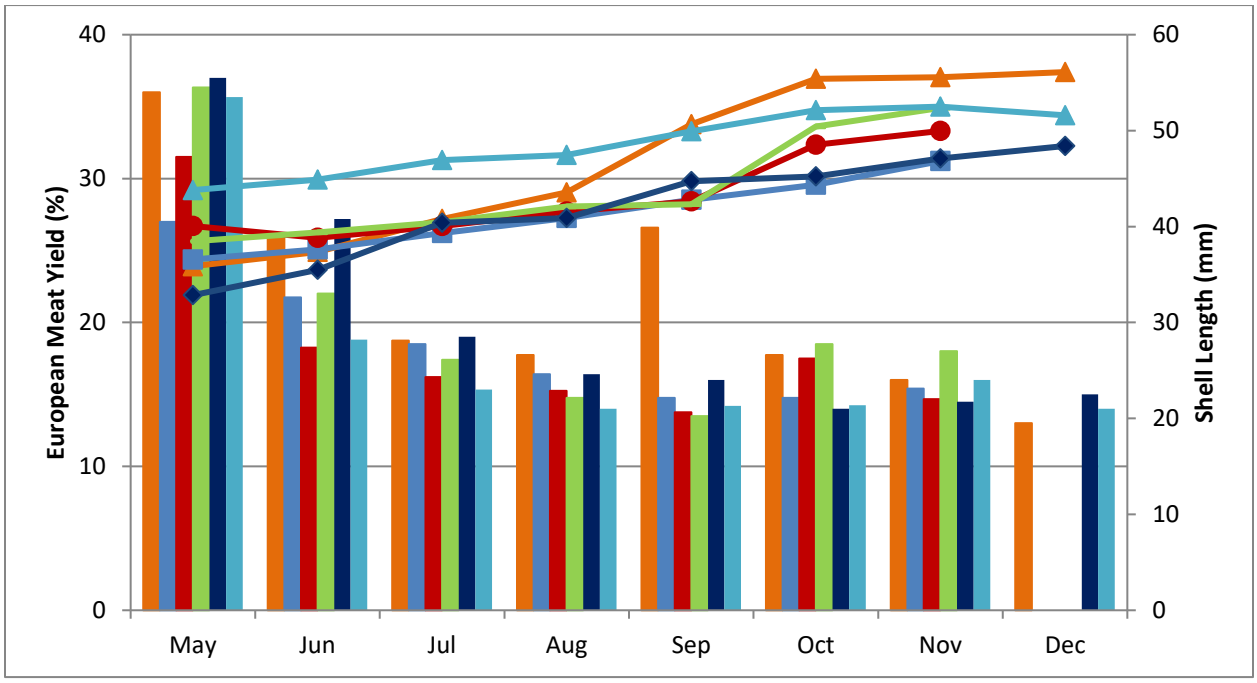
Orwell Bay European Meat Yield and Shell Length, 2016-2021.



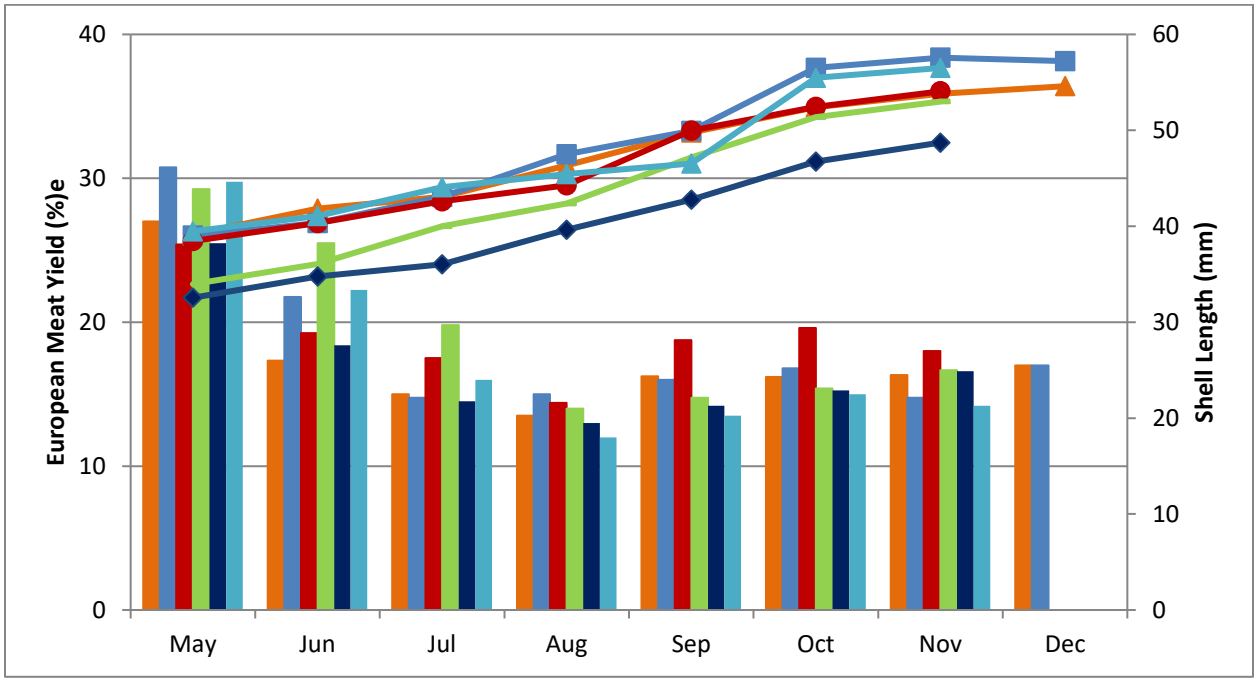
Rustico Bay European Meat Yield and Shell Length, 2016-2021.



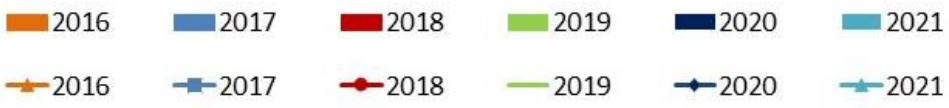
Savage Harbour European Meat Yield and Shell Length, 2016-2021.

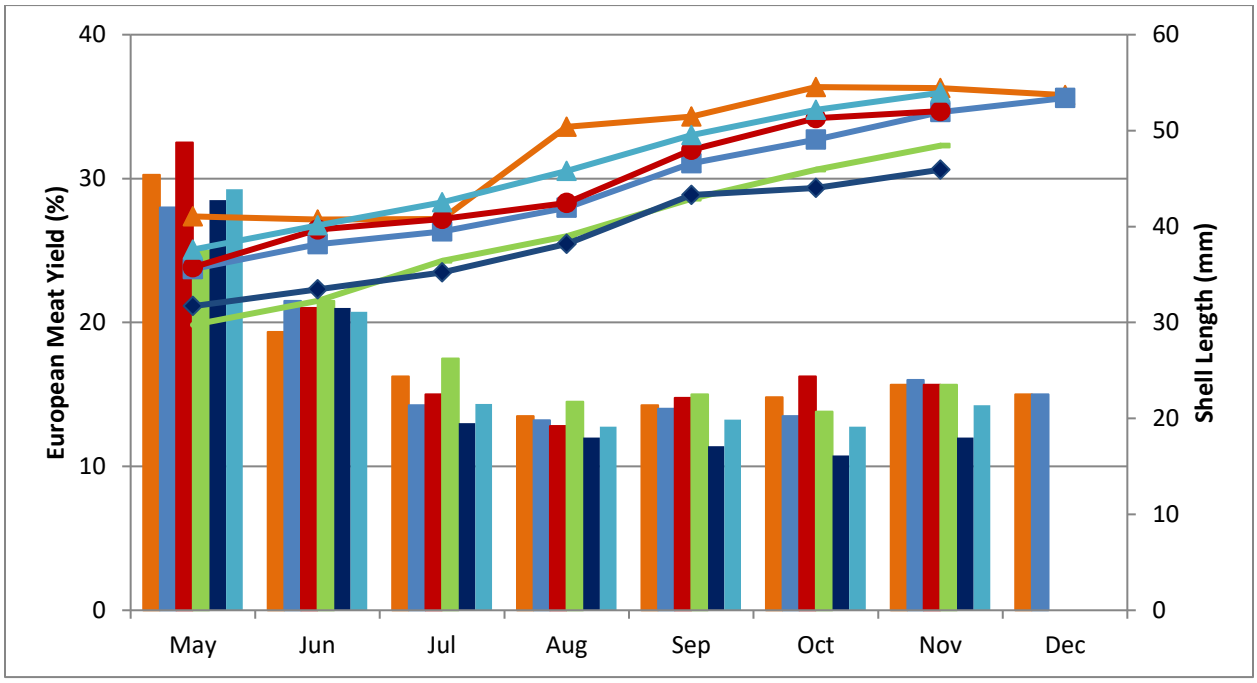


St. Mary's Bay European Meat Yield and Shell Length, 2016-2021.

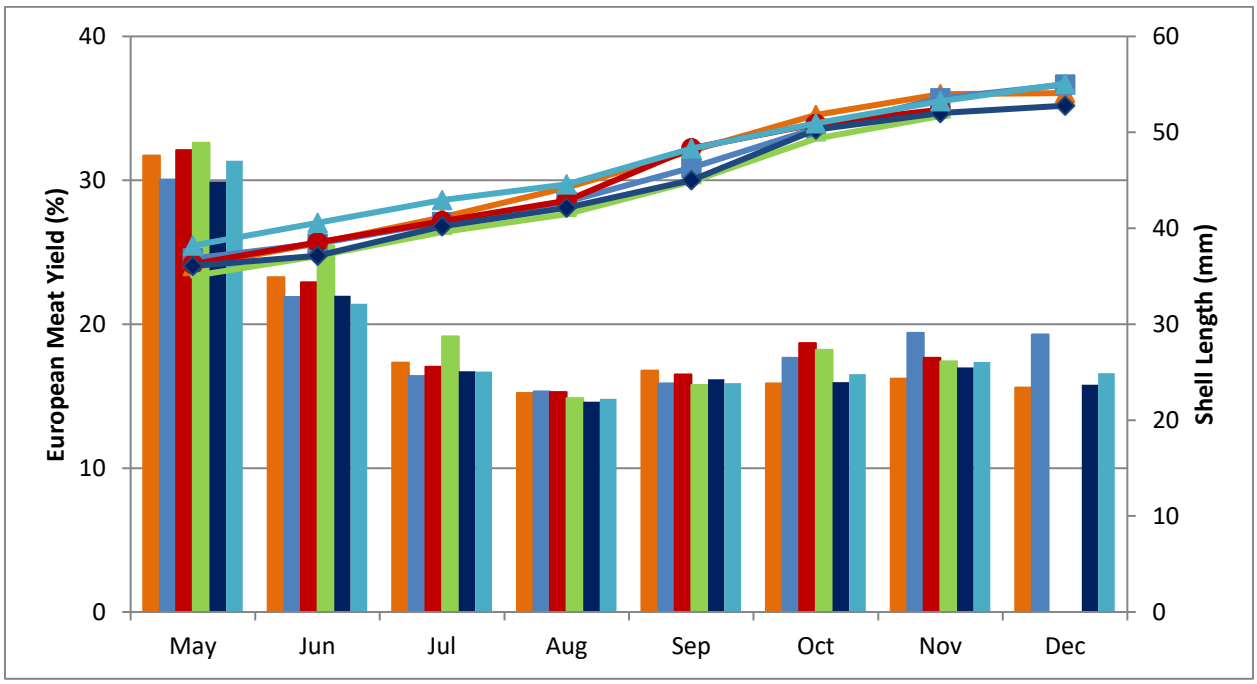


St. Peter's Bay European Meat Yield and Shell Length, 2016-2021.





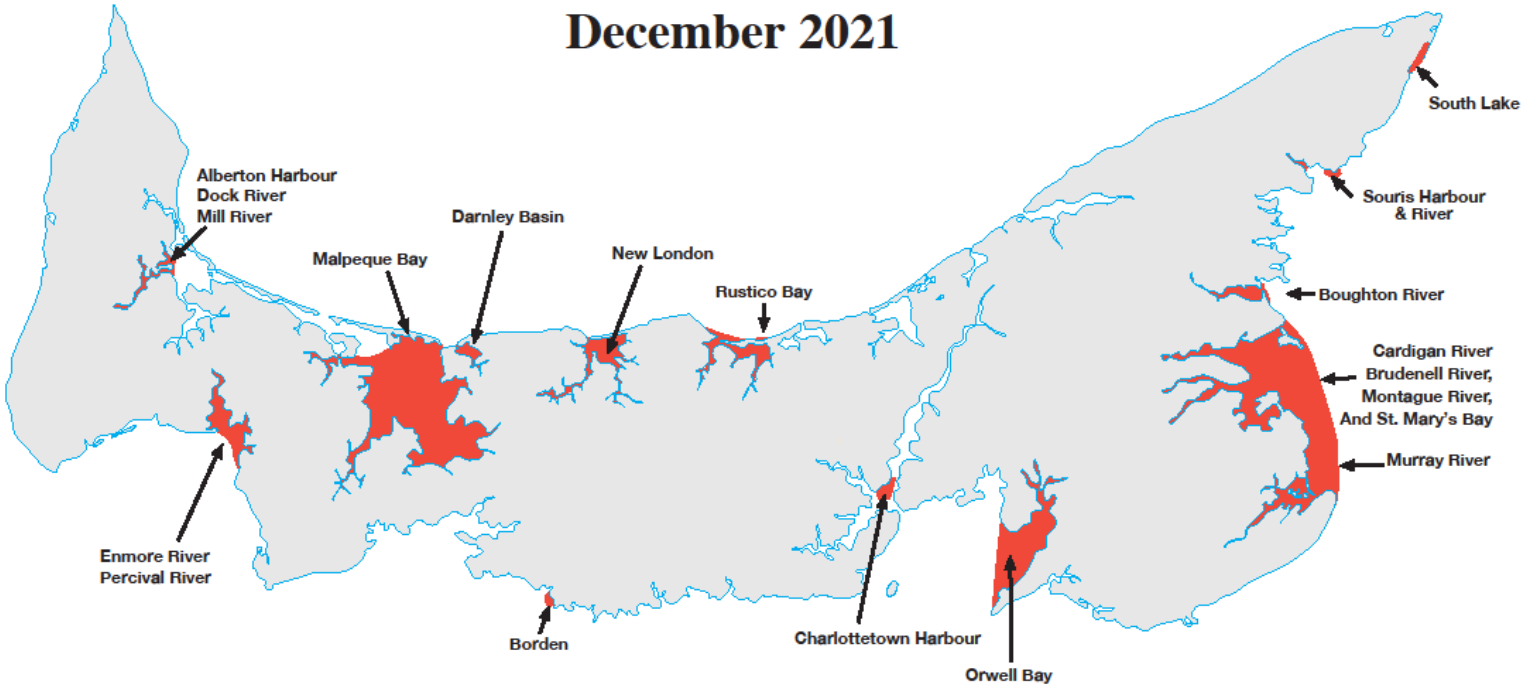
Tracadie Bay European Meat Yield and Shell Length, 2016-2021.



European Meat Yield and Shell Length – 2016-2021 – All Areas Combined.

APPENDIX V MAPS DISPLAYING CURRENT KNOWN RANGE OF INVASIVE TUNICATES IN PEI

Known Range of Clubbed Tunicate December 2021



Known Range of Vase Tunicate December 2021