Supplementary figures and tables for:

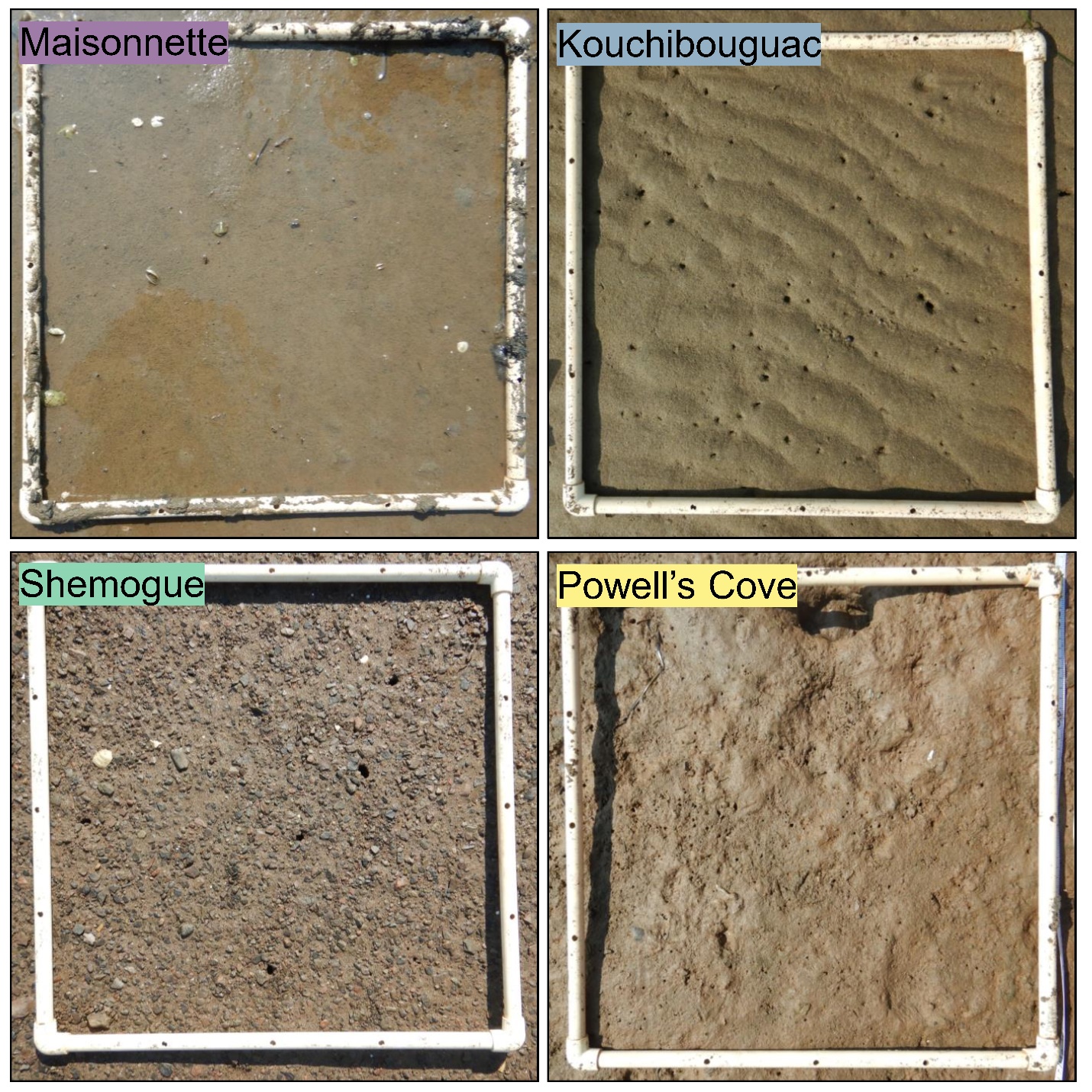
**Can siphon holes be used for population assessments of intertidal soft-shell clams, *Mya arenaria*?**

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**Figure S1.** Overhead images of the sediment surface at each of the four study sites.

A graph of a graph

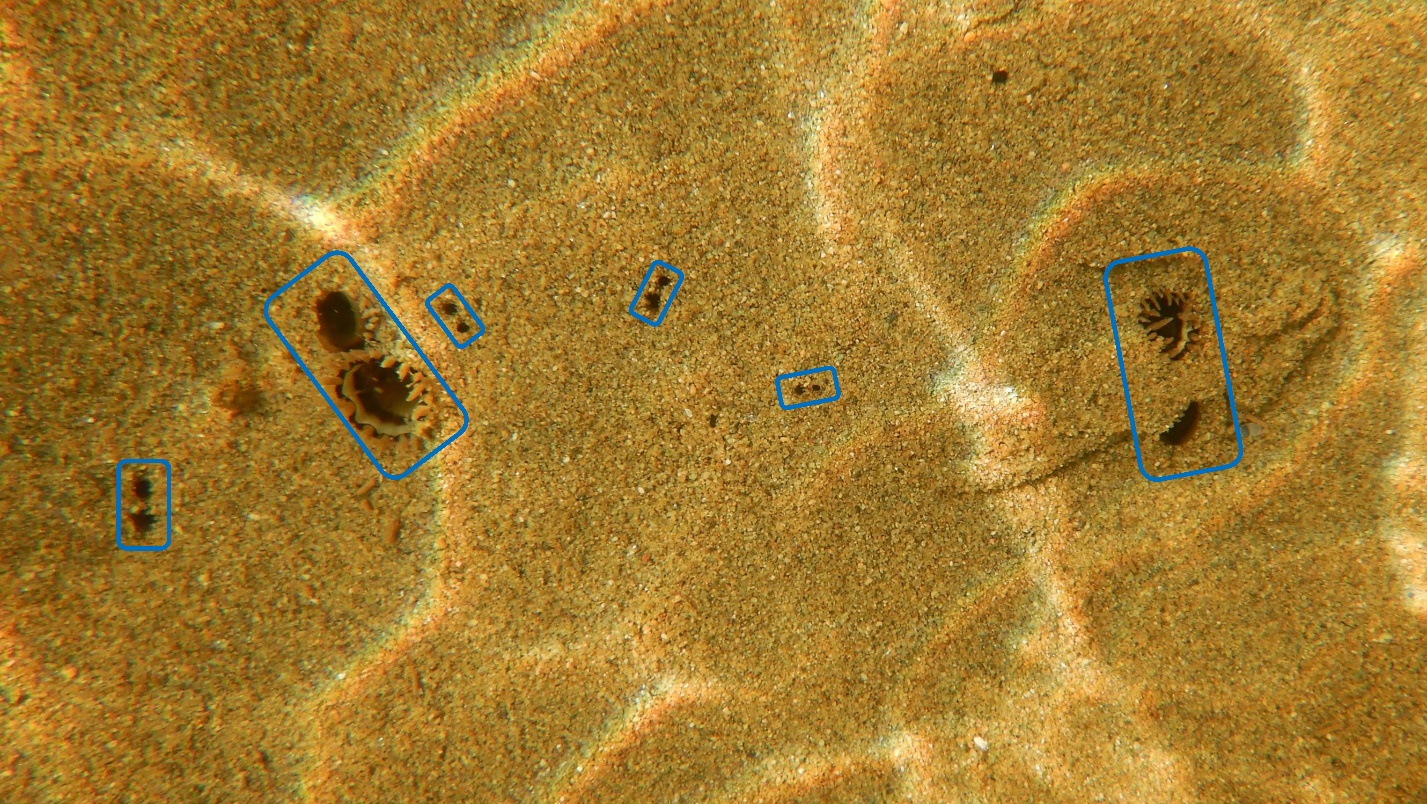
Description automatically generated with medium confidence

**Figure S2.** Temperature (°C) time-series profiles at each of the four study sites. Each point represents the daily mean seawater temperature.

A group of graphs showing different types of lines

Description automatically generated

**Figure S3.** Relationships between siphon hole counts and total clam counts (i.e., clams both above and below 20 mm shell length) at each of the four sites for each observer. The red dashed line represents a 1:1 relationship between siphon hole count and clam count. Open circles represent excluded observations in which methods or conditions deviated from the norm.



**Figure S4.** Overhead image of subtidal soft-shell clam siphon holes at the Kouchibouguac site. Visible siphons of individual clams are circled in blue. Note the defined structure of the two siphon channels for each individual clam.

A diagram of a clam count

Description automatically generated

**Figure S5.** Relationships between siphon hole counts and counts of clams >20 mm at Kouchibouguac, excluding the one large sample. The red dashed line represents a 1:1 relationship between siphon hole count and clam count.

**Table S1.** Results of ANOVA analysis for the effect of site on sediment grain size composition, % organic content, relative moisture content (%), and seawater temperature on the day of sampling. Bolded *p*-values denote statistically significant effects.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source of variation** | **df** | **SS** | **MS** | **F-value** | ***p*-value** |
| *Sediment grain size*  Site | 3 | 1.53 | 0.51 | 26.46 | **0.0002** |
| Residuals | 8 | 0.15 | 0.02 |  |  |
|  |  |  |  |  |  |
| *% organic content*  Site | 3 | 0.49 | 0.16 | 1.58 | 0.2686 |
| Residuals | 8 | 0.82 | 0.10 |  |  |
|  |  |  |  |  |  |
| *Relative moisture content*  Site | 3 | 100.84 | 33.61 | 8.55 | **0.0071** |
| Residuals | 8 | 31.47 | 3.93 |  |  |
|  |  |  |  |  |  |
| *Water temperature*  Site | 3 | 6034.50 | 2011.49 | 420.52 | **<0.0001** |
| Residuals | 1148 | 5491.30 | 4.78 |  |  |

**Table S2.** Tukey HSD contrasts for ANOVA models for the effect of site on sediment grain size composition (phi, φ), relative moisture content (%), and seawater temperature (°C) on the day of sampling. *P*-values are Bonferroni corrected such that statistical significance is achieved at *p* ≤ 0.05. Bolded *p*-values denote statistically significant differences. Note that % organic content is missing because there was no significant effect of site in the ANOVA (Table S1).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Contrast** | **Estimate** | **SE** | **df** | **t-ratio** | ***p*-value** |
| *Sediment grain size* |  |  |  |  |  |
| Maisonnette - Kouchibouguac | 0.64 | 0.11 | 8 | 5.63 | **0.0022** |
| Maisonnette - Powell’s Cove | -0.17 | 0.11 | 8 | -1.48 | 0.4906 |
| Maisonnette - Shemogue | -0.29 | 0.11 | 8 | -2.55 | 0.1261 |
| Kouchibouguac - Powell’s Cove | -0.81 | 0.11 | 8 | -7.11 | **0.0005** |
| Kouchibouguac - Shemogue | -0.93 | 0.11 | 8 | -8.17 | **0.0002** |
| Powell’s Cove - Shemogue | -0.12 | 0.11 | 8 | -1.07 | 0.7180 |
|  |  |  |  |  |  |
| *Relative moisture content* |  |  |  |  |  |
| Maisonnette - Kouchibouguac | 4.56 | 1.62 | 8 | 2.82 | 0.0864 |
| Maisonnette - Powell’s Cove | 7.91 | 1.62 | 8 | 4.89 | **0.0053** |
| Maisonnette - Shemogue | 5.82 | 1.62 | 8 | 3.60 | **0.0289** |
| Kouchibouguac - Powell’s Cove | 3.35 | 1.62 | 8 | 2.07 | 0.2411 |
| Kouchibouguac - Shemogue | 1.26 | 1.62 | 8 | 0.78 | 0.8611 |
| Powell’s Cove - Shemogue | -2.09 | 1.62 | 8 | -1.29 | 0.5939 |
|  |  |  |  |  |  |
| *Temperature* |  |  |  |  |  |
| Maisonnette - Kouchibouguac | 1.47 | 0.18 | 1148.00 | 8.08 | **<.0001** |
| Maisonnette - Powell’s Cove | -3.98 | 0.18 | 1148.00 | -21.83 | **<.0001** |
| Maisonnette - Shemogue | 1.76 | 0.18 | 1148.00 | 9.65 | **<.0001** |
| Kouchibouguac - Powell’s Cove | -5.45 | 0.18 | 1148.00 | -29.91 | **<.0001** |
| Kouchibouguac - Shemogue | 0.29 | 0.18 | 1148.00 | 1.58 | 0.3927 |
| Powell’s Cove - Shemogue | 5.74 | 0.18 | 1148.00 | 31.48 | **<.0001** |

**Table S3.** Tukey HSD contrasts for ANCOVA models for the effect of siphon hole length and site on clam shell length (in mm) and clam weight (in g). *P*-values are Bonferroni corrected such that statistical significance is achieved at *p* ≤ 0.05. Bolded *p*-values denote statistically significant differences.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Contrast** | **Estimate** | **SE** | **df** | **t-ratio** | ***p*-value** |
| *Shell length* |  |  |  |  |  |
| Maisonnette - Kouchibouguac | 0.207 | 2.24 | 192 | 0.093 | 0.9997 |
| Maisonnette - Powell’s Cove | -11.47 | 2.52 | 192 | -4.56 | **0.0001** |
| Maisonnette - Shemogue | -4.434 | 2.24 | 192 | -1.976 | 0.2007 |
| Kouchibouguac - Powell’s Cove | -11.677 | 2.23 | 192 | -5.244 | **<.0001** |
| Kouchibouguac - Shemogue | -4.641 | 1.92 | 192 | -2.423 | 0.0761 |
| Powell’s Cove - Shemogue | 7.036 | 2.23 | 192 | 3.15 | **0.0101** |
|  |  |  |  |  |  |
| *Wet weight* |  |  |  |  |  |
| Maisonnette - Kouchibouguac | 0.43 | 1.87 | 192.00 | 0.23 | 0.9956 |
| Maisonnette - Powell’s Cove | -6.28 | 1.88 | 192.00 | -3.35 | **0.0054** |
| Maisonnette - Shemogue | -9.87 | 2.10 | 192.00 | -4.70 | **<.0001** |
| Kouchibouguac – Powell’s Cove | -6.71 | 1.60 | 192.00 | -4.20 | **0.0002** |
| Kouchibouguac - Shemogue | -10.30 | 1.86 | 192.00 | -5.54 | **<.0001** |
| Powell’s Cove - Shemogue | -3.59 | 1.87 | 192.00 | -1.92 | 0.2213 |