



Figure S1: Photograph of the experimental set up after deployment.

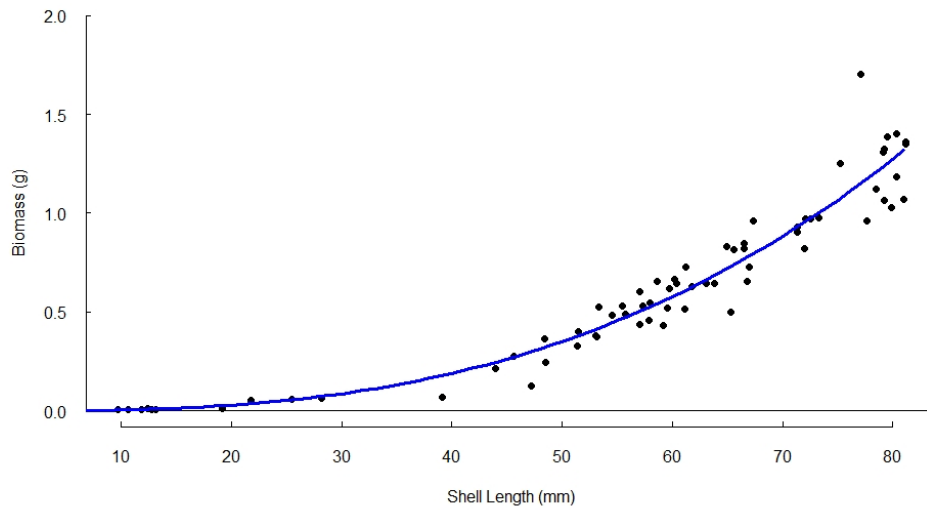


Figure S2: Mussel allometry curve based on the final mussel biomass and lengths from the experiment. Initial biomass (g/m^2) was estimated using the allometric equation ($\text{biomass} = a * \text{length}^b$, where $a = 0.0000075$, $b = 2.75$).

Table S1: Number of *L. irrorata* (LI), *N. usnea* (NU), dead mussels, and mussel recruits recorded over the course the experiment.

| Treatment | No. of LI | No. of NU | No. dead mussels | No. mussel recruits (Day 124) |
|-----------|-----------|-----------|------------------|-------------------------------|
| 0 | 0 | 0 | 0 | 2 |
| 1 | 0 | 1 | 0 | 0 |
| 2 | 0 | 0 | 1 | 3 |
| 4 | 0 | 1 | 1 | 5 |
| 8 | 1 | 0 | 1 | 1 |

Table S2: Linear regressions between parameters.

| | Equation | R ² | df | F | p-value |
|--|-----------------------|----------------|-------|-------|---------|
| Nitrification x Belowground biomass | $y = 0.81x + 274.29$ | 0.12 | 1, 16 | 2.26 | 0.15 |
| Denitrification x Belowground biomass | $y = 0.33x + 1701.58$ | 0.03 | 1, 18 | 0.698 | 0.41 |
| Root x mussel biomass | $y = 0.48x + 283.07$ | 0.37 | 1, 18 | 10.89 | 0.00 |
| CO ₂ max x leaf density | $y = -0.06x + 123.89$ | 0.48 | 1, 18 | 18.75 | <0.001 |
| CH ₄ Flux x Belowground biomass | $y = 0.18x + 155.69$ | 0.27 | 1, 18 | 6.86 | 0.01 |
| CH ₄ Flux x Root biomass | $y = 0.46x + 100.62$ | 0.37 | 1, 18 | 10.58 | 0.004 |

Table S3: Correlation results between variables.

| Correlation Pair | T | df | p-value | Pearson's correlation |
|-----------------------------------|-------|----|---------|-----------------------|
| Mussel density x Mussel biomass | 8.64 | 18 | <0.001 | 0.89 |
| Nitrification x NH ₄ | -0.38 | 16 | 0.72 | -0.09 |
| Nitrification x NO _x | -0.09 | 16 | 0.93 | -0.02 |
| Denitrification x NH ₄ | 0.09 | 18 | 0.92 | 0.02 |
| Denitrification x NO _x | 0.58 | 18 | 0.57 | 0.14 |