Annual Report 2025 Peconic Estuary Partnership Aquaculture Impact Study Phase II

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In our previous report submitted in May 2025, we had shown that valve gaping data may be used as a reliable proxy of water clearance activity by the Eastern oyster, *Crassostrea virginica*. In laboratory experiments we found that quantifiable valve gaping metrics such as % of time open, as well as the frequency of partial closures (associated with feces and pseudofeces expulsions), are positively and significantly associated with the production of biodeposits. In the laboratory, oysters were open for approximately 25% of the time and displayed extended durations of closures irrespective of food availability. However, under high food conditions (algae cell concentrations > 3000 cells ml^{-1}), the frequency of partial closures was approximately 2.5 times higher than that under low food conditions, coinciding with a nearly 4 times higher biodeposition rate. Overall, the data indicated that partial closure frequency may present as a more sensitive proxy of biodeposition rate than the percent of time open alone.

In Part I of this report, we summarize data from additional laboratory experiments that assessed the temperature dependency of biodeposition rates and assessed the role of food quality by exposing oysters to algae, clay particles, and algae-clay mixtures.

In Part II, we summarize data from field deployments between July and October 2025 in which oyster valve gaping activity was monitored *in situ* at 5 established aquaculture sites in the Peconic Bay, including both floating and bottom cages. In parallel, water quality data and hydrodynamic conditions were recorded to assess the relationship between biodeposition and environmental parameters, as inferred from valve gaping data.

Presentations in 2025:

Oral Presentation: Porter-Pompey, B., Dwyer, I., Volkenborn, N. (2025). *Quantifying biofiltration of oysters in aquaculture using valve gape sensors.* 28th Biennial Coastal & Estuarine Research Federation Conference. Estuaries: Tradition and Transition, November 9-13, 2025, Richmond, VA.

Part I: Valve gaping behavior in response to seston quality laboratory experiment

Motivation

Laboratory experiments were conducted to (1) collect additional baseline information on oyster valve gaping activity at different temperatures and (2) assess the relationship between valve gaping metrics and biodeposition in response to changes in food quantity and quality. Hall effect sensors were used to continuously record valve gaping while simultaneously collecting feces and pseudofeces biodeposits. Oysters were exposed to a range of feeding treatments at different temperatures and with differing mixtures of algae and kaolin clay. The valve gaping and biodeposition data were used to determine the quantifiable valve gape metric that best correlates with biodeposition rates (and thus removal of particles from the water column). We hypothesized that feeding behavior evidenced through valve gaping metrics such as the percent of time open and the partial closure frequency will vary among different feeding regimes.

Methods

An initial laboratory experiment was performed in April and May 2025 to provide baseline information of valve gaping activity and associated biodeposition rates at different temperatures. Oysters were held in flow-through seawater tanks in which the approximately 100 L of water in each experimental unit was replaced approximately 4 times per day with unfiltered seawater from Flax Pond. All oysters received a low supplementation of the algae *Tetraselmis*. Oysters were exposed to a temperature ramp in which the temperature was increased stepwise from 7°C, 10°C, 15°C, 20°C, to 25°C. Valve gaping data was continuously recorded by hall effect data loggers.

Oysters were kept at each target temperature for approximately 1 week. Biodeposits from individual oysters were collected over 24-hour periods, 3 times at 7°C, 10°C, and 15°C and once at 20°C and 25°C. Valve gaping data analyses was focused on the 24-hour periods of biodeposit collections.

In a second experiment, oysters were exposed to 3 different feeding treatments, including an algae-only treatment consisting of the addition of *Tetraselmis* ($3\text{-}5\times10^3$ cells ml^{-1} experienced by the oysters), a combined treatment consisting of the addition of *Tetraselmis* and seawater with 1 g L^{-1} of kaolinite clay and a clay-only treatment. Oysters were held in flow-through seawater tanks at 25°C. Feeding treatments were established in the flow-through tanks for 48 hours. Biodeposits were collected during the second 24-hour window. Algae and/or clay was pumped from a 70 L reservoir to an 80 L equilibrium tank, then pumped into a 20 L tank in which oysters were kept. Treatments were applied sequentially in all experimental units.

Results

Biodeposition rates strongly varied between temperatures and increased from 2.8±0.4 mg $oyster^{-1}$ day^{-1} (mean and SE) at 7°C to 26.4±22.6 mg $oyster^{-1}$ day^{-1} at 20°C before declining to 14.0±4.8 mg $oyster^{-1}$ day^{-1} at 25°C (Figure 1). While the steady increase in biodeposition rates was expected due to higher metabolic rates at higher temperatures. The decline of biodeposition rates at 25°C was surprising and may have been related to more efficient respiration of the organic material taken up by oysters at high

temperatures under the possibly food-limited conditions in our experiments. We are in the process of calculating and analyzing valve gaping metrics such as the % of time open and the partial closure frequency.

Biodeposition rates strongly differed between feeding treatments (Figure 2). In the combined feeding treatment, the biodeposition rates of 494±55 mg oyster^{-1} day^{-1} were almost 5 times higher than in the clay-only treatment (104±18 mg oyster^{-1} day^{-1}) and 7 times higher than in the algae-only treatment (71±10 mg oyster^{-1} day^{-1}), suggesting a synergistic rather than additive effect of simultaneous algae and clay exposure. A substantial fraction of the biodeposits in the combined treatment was organic material (Figure 2), possibly indicating less efficient uptake of organic matter by oysters in the presence of high concentrations of inorganic clay particles.

The valve gaping data were consistent with biodeposition rate data in that both the average % time open (Fig. 3) as well as the average frequency of partial closures (Fig. 5) were highest in the combined treatment compared to the algae-only and clay-only treatment. At the individual level both valve gaping metrics were significantly associated with biodeposition rates (Figs. 4 and 6). On average, oysters were open for 83% of the time in the combined treatment compared to 46% in the algae-only and 36% in the clay-only treatments indicating a pronounced response of oysters to food quality in terms of opening. The higher % of time open in the combined treatment may indicate that oysters had to spent more time to sort particles when algae were “diluted” with inorganic particles to fulfill their metabolic needs. Likewise, the average frequency of partial closures was highest in the combined treatment (10.8 ± 1.0 hr^{-1}) compared to 6.2±0.9 hr^{-1} in the algae-only treatment and 6.6 ± 2.1 hr^{-1} in the clay-only treatment (Figure 5), possibly due to a much higher frequency of pseudofeces expulsions in the combined treatment.

A linear regression model was used to compare the individual percent of time open hr^{-1} to the dry weight of particles expelled by each individual. The resultant R^2 value indicates a strong positive relationship between the average % of time hr^{-1} an individual was open throughout each feeding regime, and the biodeposition rate in each feeding regime. The R^2 value was 0.80 in the algae-only treatment, 0.94 in the combined treatment, and 0.82 in the kaolinite-only treatment (Figure 4). Linear regression was used to assess the strength of the relationship between the partial closures hr^{-1} metric and the dry weight of the biodeposits for each individual (Figure 6). The relationship was strongest in the kaolinite only treatment (R^2 = 0.71), followed by the algae-only treatment (R^2 = 0.70), and lastly the combined treatment of algae and kaolinite (R^2 = 0.64).

Next Steps

Overall, the data confirm that valve gaping data can be used as a proxy of biodeposition rates and that temperature and food quality have significant impacts on gaping behavior, and thus water clearance rates. Linear regressions displayed in Figure 4 and Figure 6 will be rerun to obtain a *p*-value to assess the statistical significance of the relationships. Repeated-Measures ANOVA will be used to assess differences is gaping behavior metrics of oysters at different temperatures and in the algae-only, kaolinite-only, and mixed feeding treatments. Further quantitative and investigative statistical analyses are to be performed.

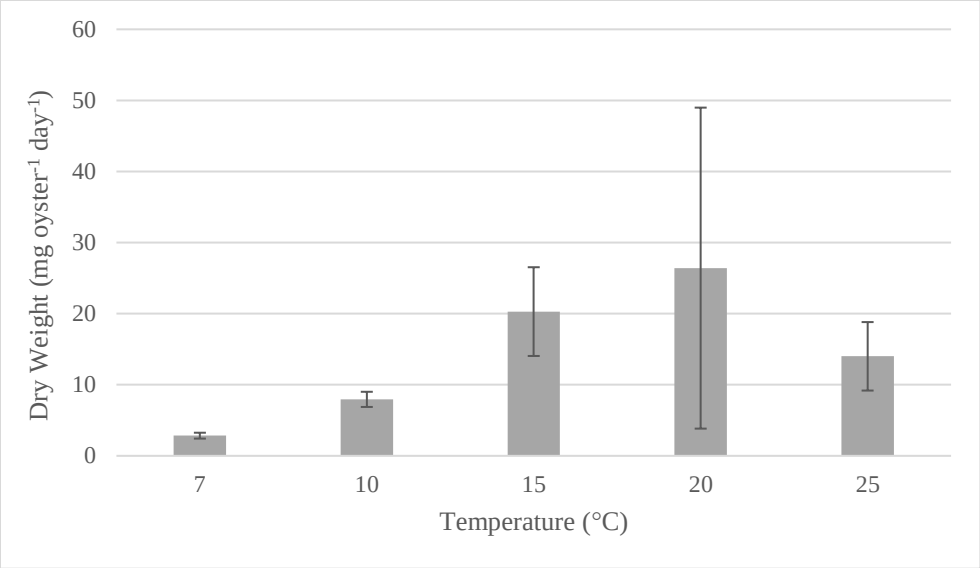


Figure 1. Bar plot of biodeposit dry weights collected from individual oysters at 7°C, 10°C, and 15°C 20°C and 25°C. during the 7°C-15°C temperature treatments 24 oysters were evenly distributed in 4 saltwater tanks and 3 repeated measurements were taken. Shown are the means of 72 total measurements. The 20°C and 25°C involved 1 measurement across 4 separate tanks, resulting in the displayed averages of 22 total measurements for either temperature treatment.

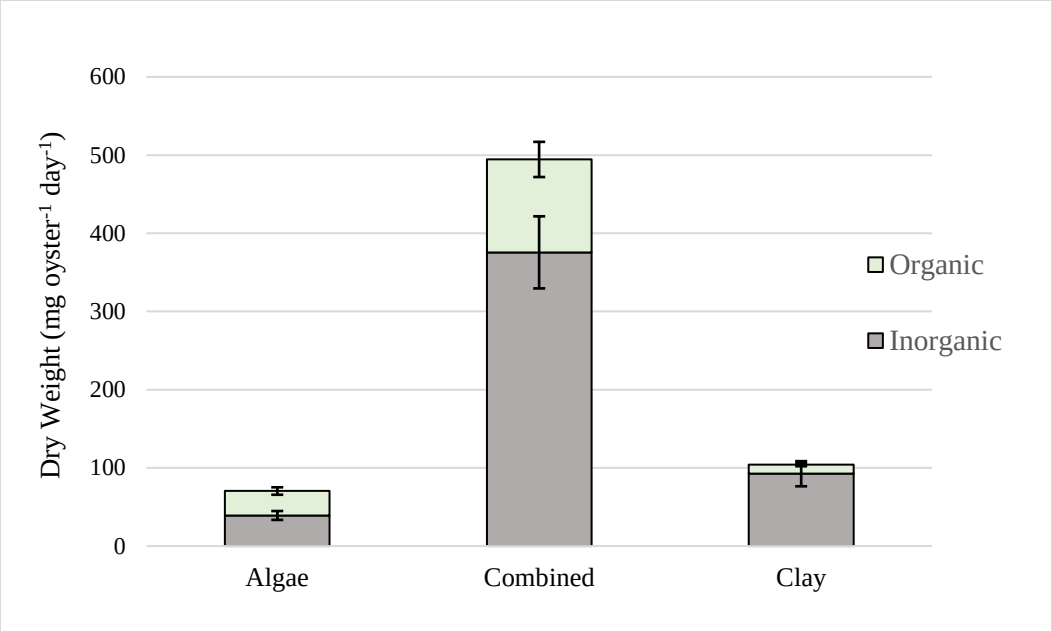


Figure 2. An average of the mass of inorganic and organic particles expelled by 22 individuals in the *Tetraselmis* treatment, 20 individuals in the combined treatment, and 20 individuals in the kaolinite clay treatment. The error bars represent the standard deviation of the burned weight between individuals of each feeding regime. The same individuals were examined across each feeding regime.

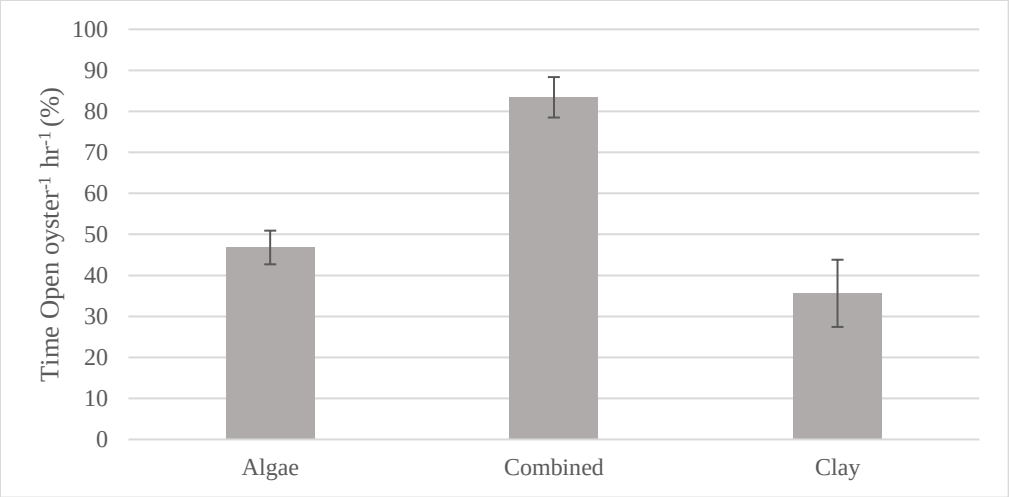


Figure 3. An average of the % of time open of each oyster across feeding regimes. In the *Tetraselmis* treatment, 22 individuals were examined, 20 individuals in the combined treatment, and 20 individuals in the kaolinite clay treatment. An average of the hourly % of time open for each individual observed was calculated. These individual means were then averaged across all individuals, giving the resultant percentage displayed in the figure. The error bars represent the standard error of the final average calculated for individuals of each respective feeding regime.

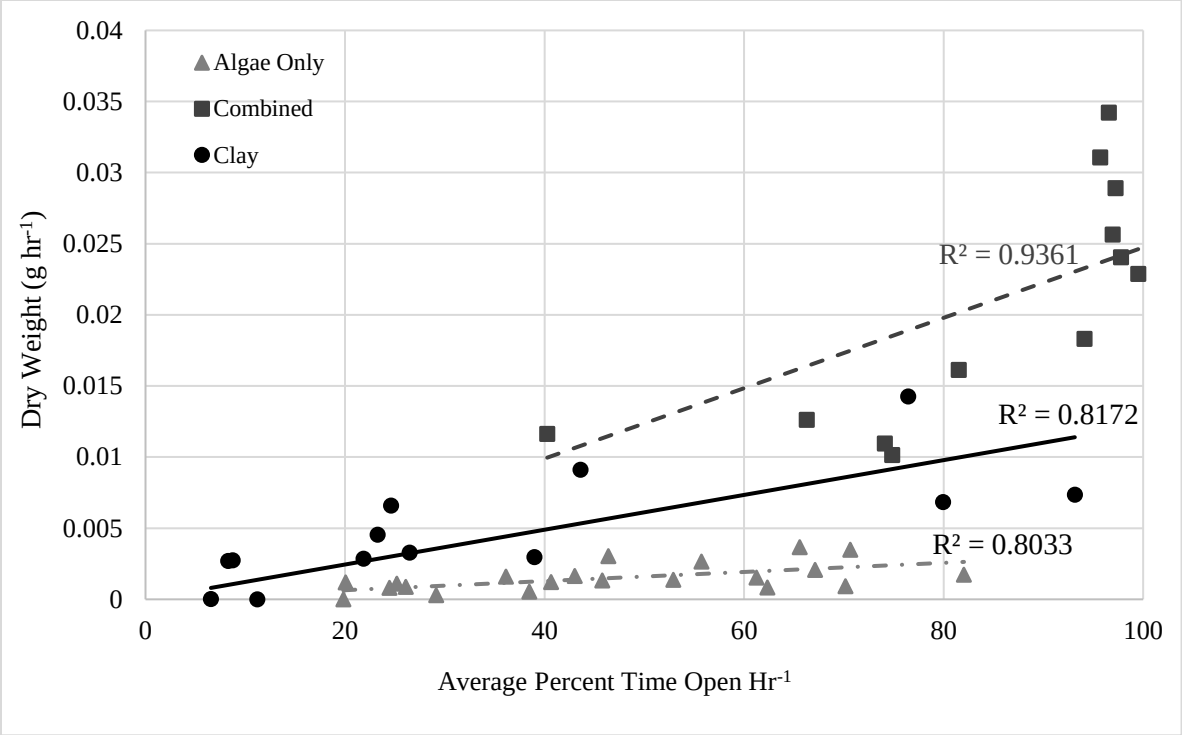


Figure 4. A linear regression of the average percent of time open per hour and the corresponding dry weight in grams per hour of each individual. Each point represents a single individual in their respective feeding regime. The lines represent the respective linear fit which were all fitted through the origin at zero.

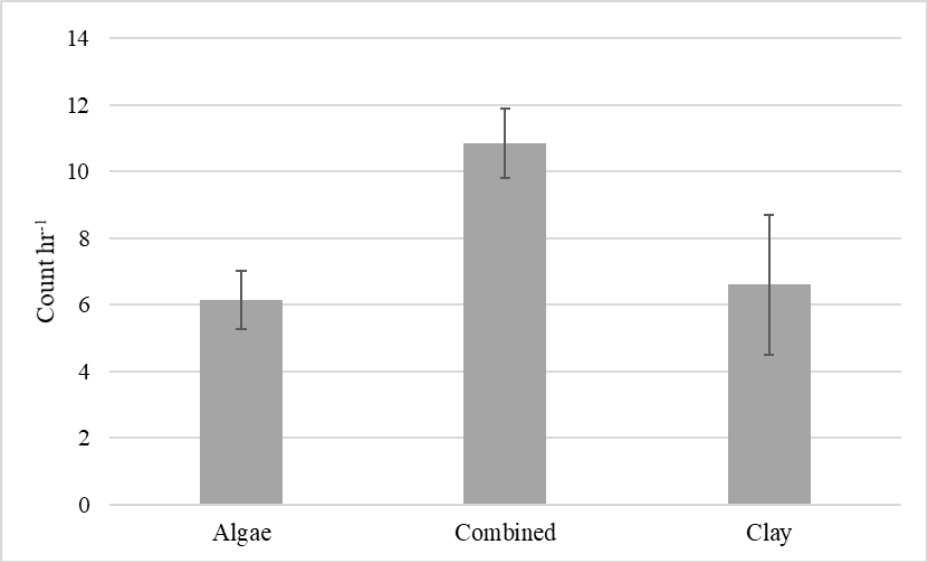


Figure 5. The average partial closure frequency hr^{-1} represented as Count hr^{-1} in an algae-only feeding regime of *Tetraselmis*, a kaolinite-only feeding regime, and a mixed feeding regime of both *Tetraselmis* and kaolinite clay. The error bars represent the calculated standard error of the average. In the *Tetraselmis* treatment, 22 individuals were examined, 20 individuals in the combined treatment, and 20 individuals in the kaolinite clay treatment.

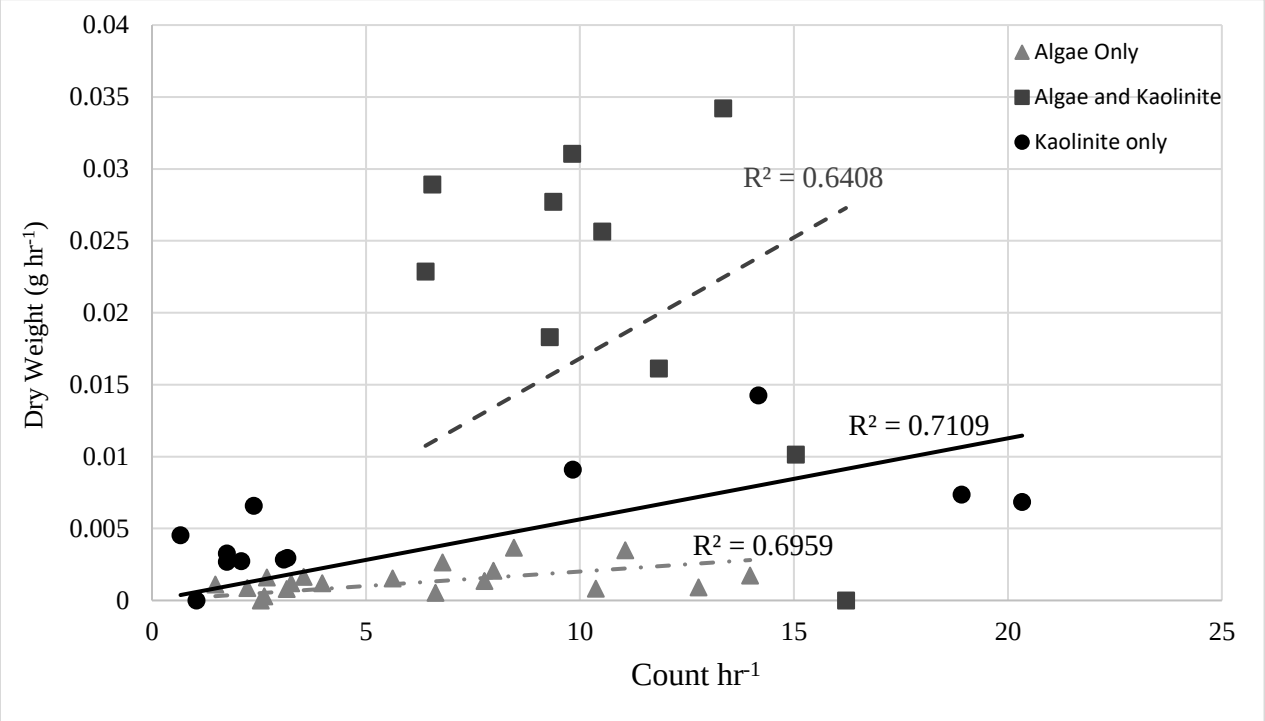


Figure 6. A linear regression of the partial closure frequency hr^{-1} presented as Count hr^{-1} on the y-axis and the corresponding dry weight in g hr^{-1} on the x-axis calculated for each individual. Each point represents an individual oyster in their respective feeding regime. The lines represent the respective linear fit which were all fitted through the origin at zero.

Part II: *In situ* deployments

Motivation

The goal of *in situ* deployments was to monitor valve gaping activity under in-situ conditions and assess the relationship between gaping activity and major environmental factors. Valve gape monitoring was done at multiple locations in the Peconic Estuary characterized by varying by depth, aquaculture cage type, hydrodynamic conditions, and geographic location within the eutrophication gradient of the Peconic Estuary to characterize which environmental conditions promote feeding as indicated through valve gaping behavior. Data will be used to explore which combinations of environmental parameters (temperature, salinity, chlorophyll α concentration, dissolved oxygen concentration, and current speed) exert the strongest influence on gaping activity and, therefore, feeding activity. By using information gained from previous laboratory experiments, this work will ultimately be used to assess which environmental conditions promote filter feeding activity and biodeposition by oysters and thus indicate enhanced water clearance services by oyster aquaculture operations.

Methods

A total of ten, 7-10 day long *in situ* deployments were carried out in 2025 at various oyster aquaculture sites within 3 of the 4 major bays of the Peconic Estuary—the Great Peconic Bay, Little Peconic Bay, and Gardiners Bay. Information about field deployment locations, collaborating aquaculture operation companies, operation type, water depth and deployment period are summarized in Table 1. Two *in situ* deployments were completed in parallel during each 7-10-day cycle. Each valve gaping data logger recorded data from 8 oysters in parallel. Adult oysters (82.4±4.2 mm) were obtained from Hampton Oyster Company. Hall effect sensors were attached to oysters in the lab and oysters were placed in small plastic oyster cages during the deployments. Individual sensors sometimes stopped working mid- or early-deployment, thereby decreasing the sample size for some deployments.

YSI Exo2 sondes were used to record temperature, salinity, chlorophyll α concentration, dissolved oxygen concentration, pH, and turbidity once every 10 minutes. TCM-1 Lowell current meters were used to record the current speed and direction at a frequency of once every minute. The plastic oyster cages with the experimental oysters and all data loggers were attached to oyster aquaculture cages (Figure 7) and left untouched at the site during the duration of the deployment.

SCUBA divers deployed equipment on oyster cages, except for those of the Oysterponds deployments. For those sites with repeated deployments, different cages were used for each deployment within the same site. Cages within sites were chosen out of convenience of boat drop-off and diver access. Collaboration with oyster companies was based on the need for sites in each bay of the Peconic Estuary in addition to the willingness of the baymen to leave the cage untouched during their peak harvesting season. Five established oyster aquaculture sites within 3 bays of the Peconic Estuary were used—Peconic Baykeeper (PBK), Hampton Oyster Company (HOC), North Fork Big Oyster Company (NFBO), Shellworks Oyster Company (SOC), and Oysterponds Shellfish Company (OP) (Figure 8). Site information and characteristics are listed in Tables 1 and 2 respectively. Peconic Baykeeper was the only site within a shallow bay next to a salt marsh. The remaining sites were located further offshore.

In between field deployments, oysters remained in their cages and attached to hall effect sensors in a flow through sea water tank at the Flax Pond Marine Laboratory (FPML). Hall effect sensors were reapplied 3 times over the duration of field deployments. By the time of the Oysterponds deployment, all hall effect sensors were replaced with new sensors and applied to the oysters. YSI sondes were recalibrated before

each deployment. There were no deaths of oysters and individuals were not replaced throughout the duration of the summer and fall field deployments.

Results

Field deployments between July and October covered a wide range of environmental conditions (Table 2). The mean water temperature during a deployment varied between 13.57°C and 26.19°C, the mean chlorophyll concentration between 4.26 μL^{-1} and 14.09 μL^{-1}, and the mean current velocity between 3.98 and 9.44 cm s^{-1}. The water remained normoxic during all deployments with mean dissolved oxygen concentration between 6.72 mg L^{-1} and 8.88 mg L^{-1}. The mean salinity varied between 28.5 PSU and 31.59 PSU across all field deployments.

Chlorophyll α concentrations were consistently highest during August deployments. Chlorophyll α concentration at PBK presented pronounced temporal variation (12.93 ± 10.26 µg L^{-1}). Salinity was regularly highest at the OP site (September; 31.59 ± 0.04 PSU) and lowest in the PBK site in August (28.50 ± 0.10 PSU). At each applicable site, dissolved oxygen was lowest in July or August deployments (excluding OP in which no summer deployments were performed). The PBK site was characterized by the lowest dissolved oxygen measurements (August) with the greatest standard deviation from the mean (6.36 ± 0.80 mg L^{-1}). In terms of current speed, the HOC site experienced the lowest speed (October; 3.98 ± 1.64 cm s^{-1}) and SOC experienced the greatest current speed (August; 9.44 ± 4.78 cm s^{-1}). The PBK site was characterized by the greatest variation in current speed with a mean and standard deviation of 8.43 ± 6.68 cm s^{-1} in the October deployment. Turbidity and pH data are shown in Table 3, but will have to be reevaluated due to possible technical issues.

In situ oyster valve gaping behavior differed strongly from gaping behavior under laboratory conditions that was recorded from the same individuals in-between deployments (Fig. 9), with more animals more frequently and longer closed in the laboratory. The switch between intermittent activity in the lab and >85% of the time open in the field occurred quite abruptly and was consistently detected. Interestingly, the only time oysters in the laboratory showed similar high activity (in terms of % of time open) was when oysters were exposed to the combined algae-clay treatment (Fig. 3). Across all field deployments, oysters remained open between 82.5% of the time at OP in the second September deployment and 95.8% at the second PBK deployment in October (Fig. 10), while oysters were open for only 66% of the time under laboratory conditions in between deployments.

The average frequency of partial closures varied more strongly between deployments. The highest mean partial closure frequency across one full deployment was 14.9 h^{-1} which was recorded at PBK in August. This was approximately 3 times higher than the lowest partial closure frequency of 5.2 h^{-1} which was recorded at the same site in October, consistent with generally higher partial closure frequencies in the warmer months with high chlorophyll concentrations (Fig. 11, Table 2).

High-resolution time series of valve gaping and environmental data reveal the dynamic nature of environmental conditions and associated valve gaping activity patterns at aquaculture sites. Visual inspection of the data suggests that oysters typically remained open during periods of high chlorophyll and increased water velocities, while more oysters closed for longer periods of time during slack tides with reduced chlorophyll concentrations (Figs. 12 and 13). The data also suggest more frequent and extended closures in floating than in bottom cages (Fig. 14).

Next Steps

We are in the process of further processing and analyzing these complex multivariate data sets. Statistical tests will be conducted to assess potential correlations between single and combinations of environmental variables and gaping activity, focusing on periods of high feeding activity (as indicated by high partial closure frequency) and periods of low feeding activity (indicated by full closures and/or low partial closure frequency). By combining valve gaping data (the associated biodeposition rates) with valve gaping data collected in the field we will model and extrapolate biodeposition rates and thus water clearing services provided by oyster aquaculture operations.



Figure 7. Orientation of scientific gear deployed on a bottom oyster cage with oysters inside a smaller cage, TCM-1 current meter, waterproofed housing, and YSI Exo2 sonde pictured from left to right

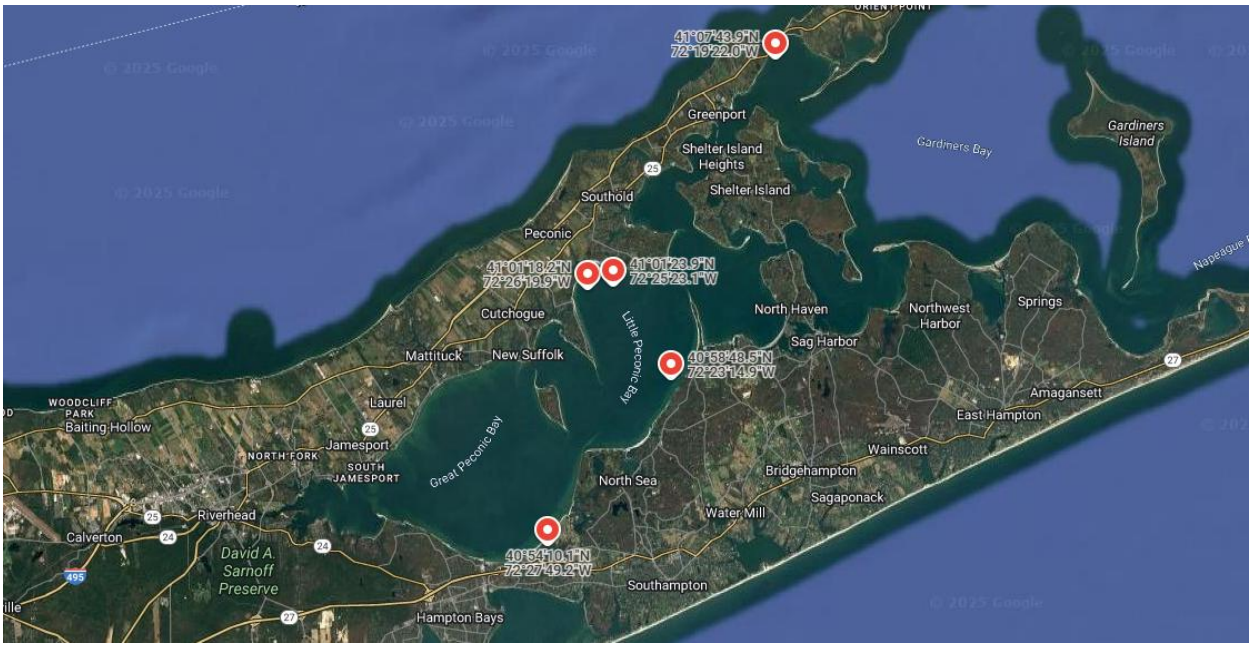


Figure 8. Map of aquaculture site locations in various bays within the Peconic Estuary of Long Island, NY in which field deployments from July through November 2025 were conducted. Sites include Peconic Baykeeper in the south fork side of the Great Peconic Bay; Hampton Oyster Company and North Fork Big Oyster Company in the north fork side of the Little Peconic Bay; Shellworks Oyster Company in the south fork side of the Little Peconic Bay; and Oysterponds Shellfish Company in the north fork side of Gardiners Bay.

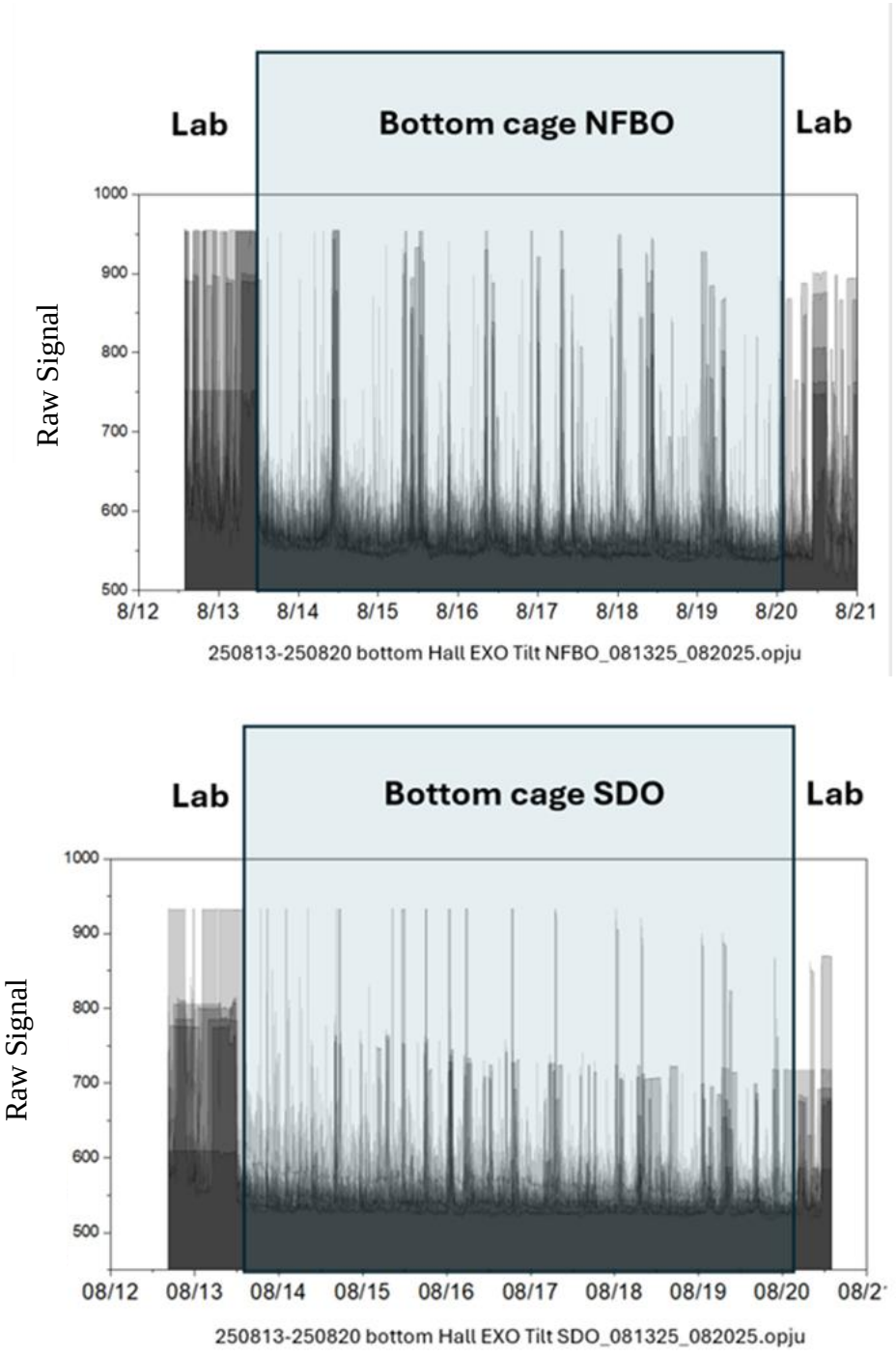


Figure 9. Valve gaping record from oysters (grey lines) before, during and after field deployments. The maximal valve gaping signal from each sensor indicates that an oyster was closed. The raw signal from each individual oyster is shown as a gray line such that periods during which multiple animals were closed appear darker.

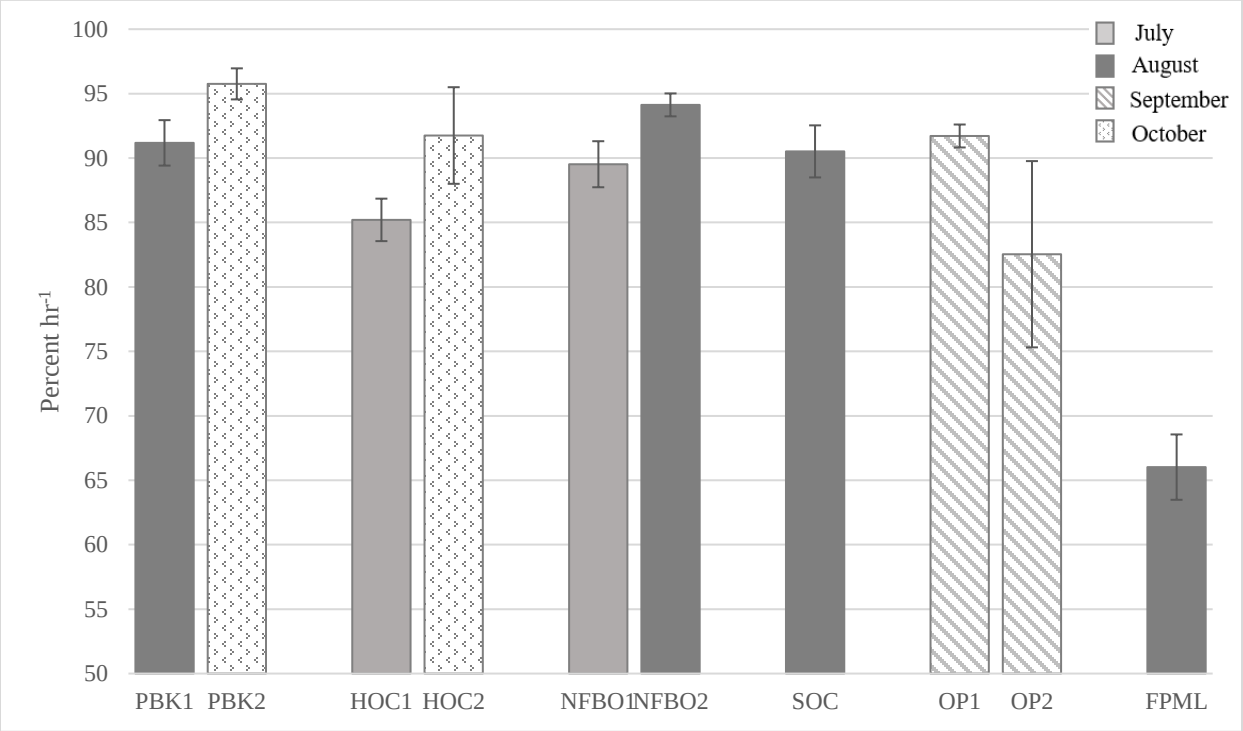


Figure 10. The average % of time open hr^{-1} at PBK1 (n = 10), PBK2 (n = 5), HOC1 (n = 5), HOC2 (n = 5), NFBO1 (n = 6), NFBO2 (n = 6), SOC (n = 6), OP1 (n = 6), and OP2 (n = 6) as indicated on the x-axis. The sites are displayed left to right in order of west to east within the estuary. The error bars represent the standard error of the observations. For applicable sites, the bars are split between the first and second deployments, often occurring during different months. The various months in which data was collected are differentiated by patterns and colors as listed in the legend.

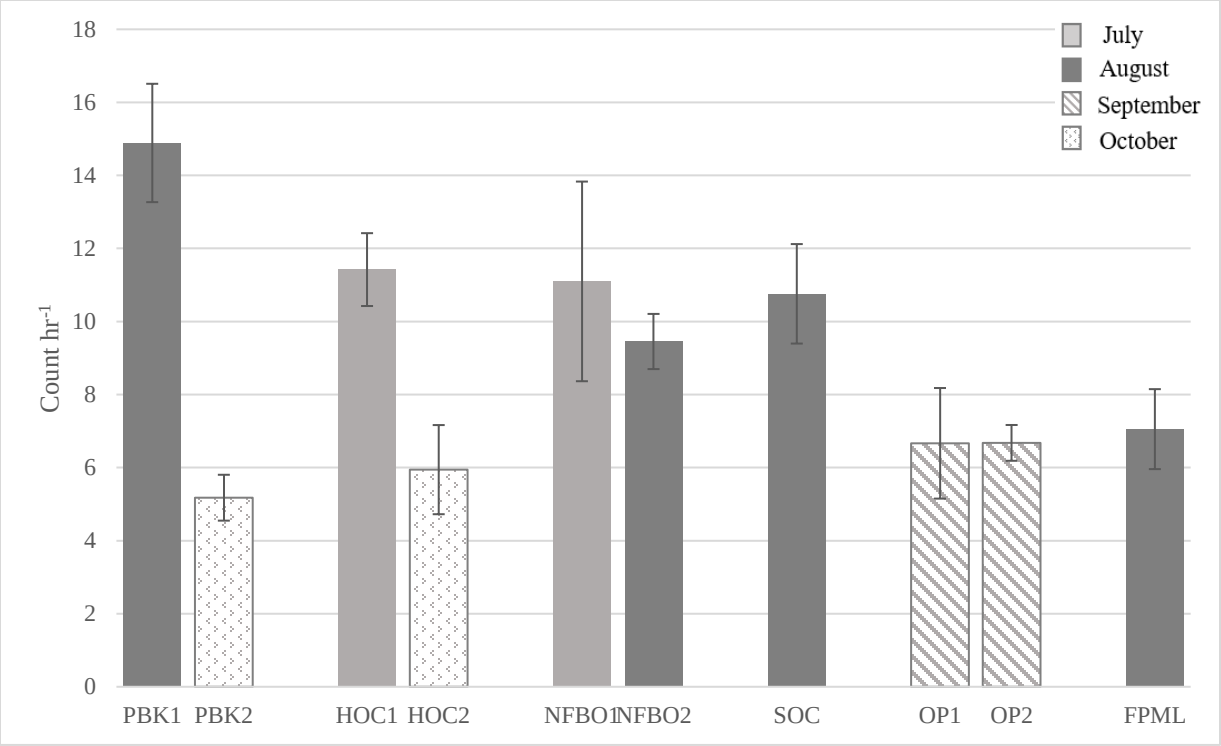


Figure 11. The average frequency of partial closures hr^{-1} as indicated on the y-axis. The x-axis lists the sites in which deployments occurred in order of the westernmost site to the easternmost site. The sites included PBK1 (n = 10), PBK2 (n = 5), HOC1 (n = 5), HOC2 (n = 5), NFBO1 (n = 6), NFBO2 (n = 6), SOC (n = 6), OP1 (n = 6), and OP2 (n = 6). For applicable sites, the bars are split between the first and second deployments, often occurring during different months. The various months in which data was collected are differentiated by patterns and colors as listed in the legend. The error bars represent the standard error of the observations.

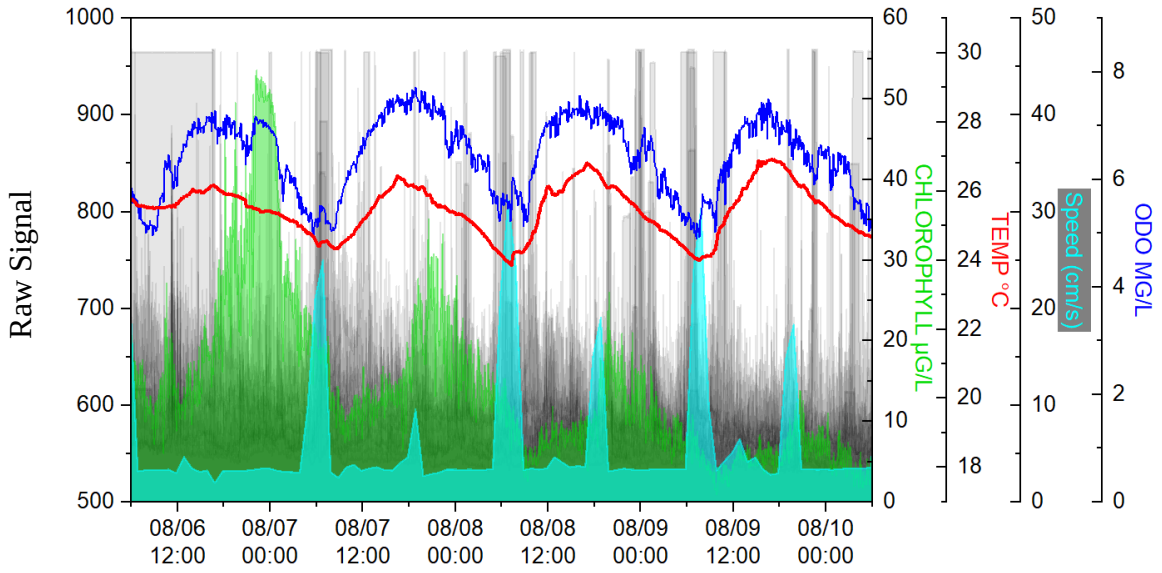


Figure 12. Valve gaping record from oysters (gray lines), chlorophyll concentrations (green area), temperature (red line), dissolved oxygen concentrations (blue line), and current speed (light blue area) during a floating cage field deployment in a shallow embayment (Peconic Baykeeper) in August 2025. The maximal valve gaping signal indicates that an oyster was closed. The raw signal from each individual oyster is shown as a gray line, such that periods when multiple animals were closed appear dark.

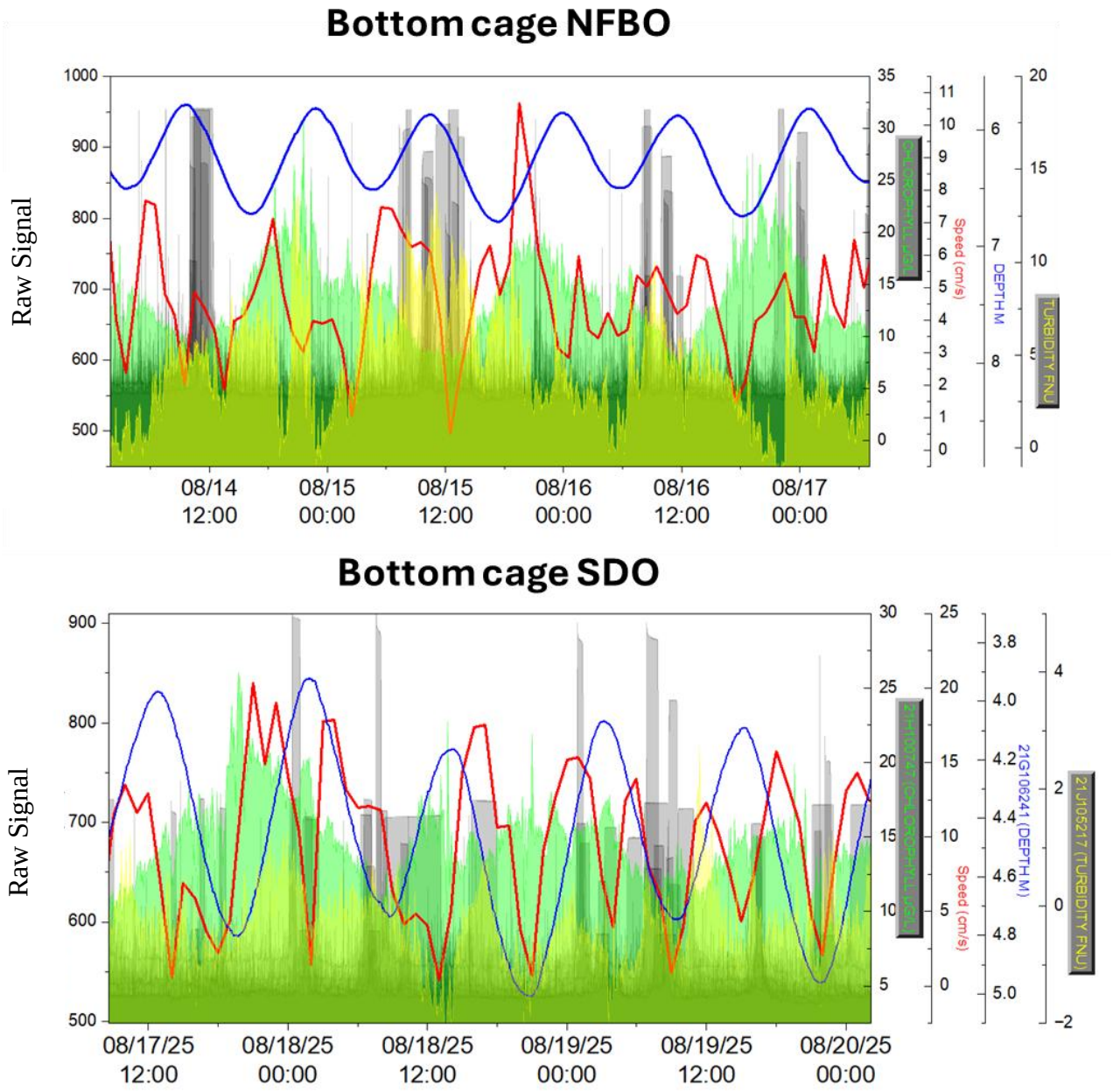


Figure 13. Valve gaping record from 6 oysters (grey lines), chlorophyll concentrations (green area), turbidity (yellow area), current velocities (red line), and water depth (blue line) during field deployments at 2 bottom cages in mid-August. The maximal signal in the valve gaping record of each sensors indicates that the oyster is fully closed. Darker areas indicate time periods when multiple oysters were closed.

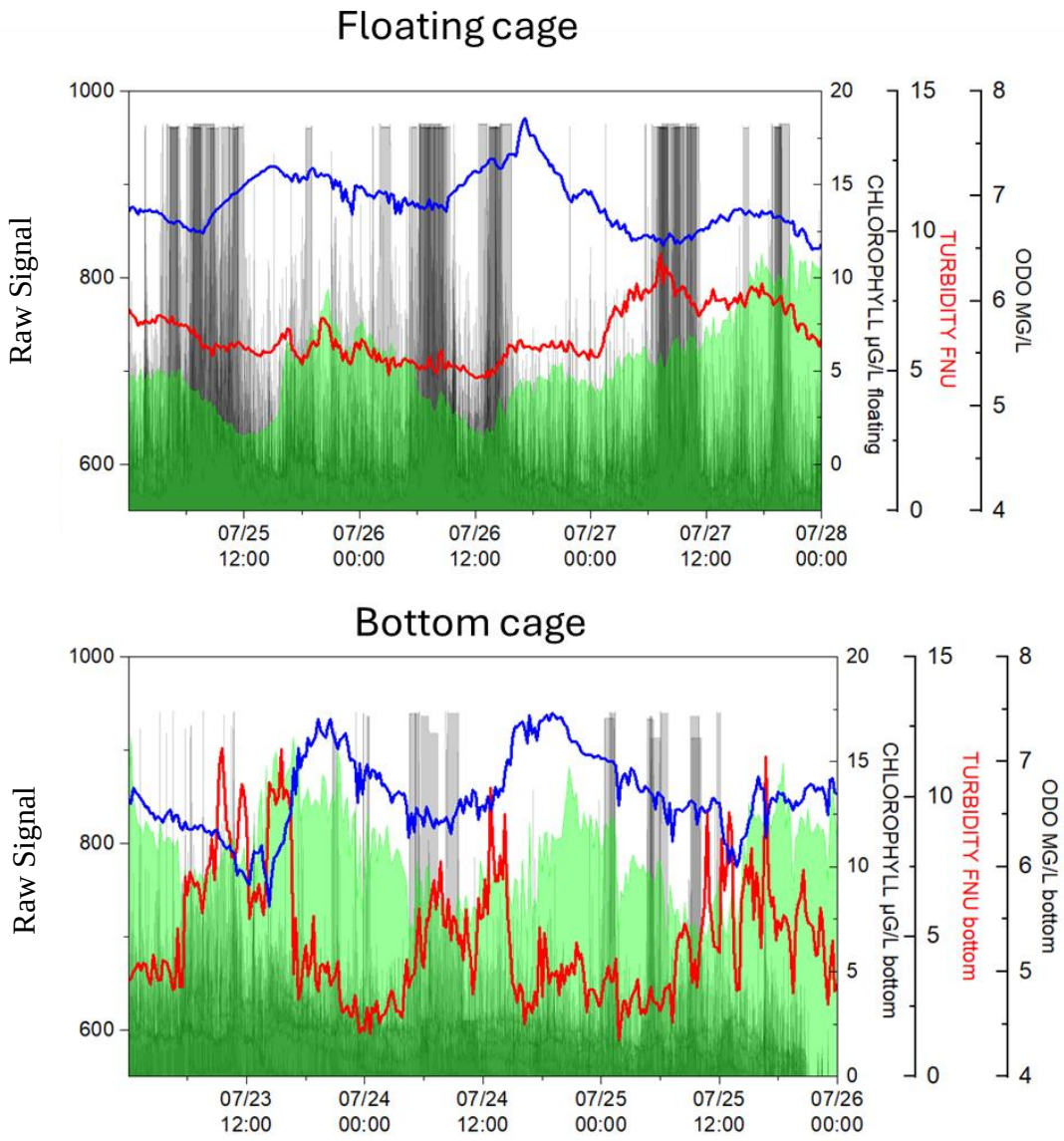


Figure 14. Valve gaping record from 5 oysters (gray lines), chlorophyll concentrations (green area), dissolved oxygen concentrations (blue line) and turbidity (red line) during 3 days of field deployments at one floating and one bottom cage in late July. The maximal signal in the valve gaping record of each sensor indicates that the oyster is fully closed. Dark areas indicate time periods when multiple oysters were closed.

Table 1. Site visit information and locations for oyster aquaculture sites utilized for *in situ* observations. The 'Site' column contains the names of the aquaculture operations. The 'Location' column lists in which bay of the Peconic Estuary the site is located. The 'Coordinates' column is the site's coordinate location within the Peconic Estuary. 'Cage Type' lists the type of aquaculture operation. The 'Depth" column lists the depths of data collection at each site according to the YSI depth measurement in meters. For bottom cages, this measurement is the actual mean depth ±SD of the bottom cage(s) on which measurements were taken. For floating cages, this measurement does not reflect the bottom depth, but rather the depth at which measurements were taken. The 'Visits' column lists the date and times of the deployment periods. The time is representative of when divers entered the water. Analysis was conducted on data starting one hour after the listed visit time. The number of 'Observations' represents the number of sensors which remained usable for data analysis and is not indicative of the actual number of individuals attached to hall effect sensors at each site.

Site	Location	Coordinates	Cage Type	Depth (m)	Visits	Observations
Peconic Baykeeper	Great Peconic Bay (South)	40°54'10.1"N 72°27'49.2"W	Floating	0.49±0.02	08/05/2025 14:20–08/11/2025 16:45	10
					10/15/2025 9:20–10/22/2025 10:05	5
Hampton Oyster Company	Little Peconic Bay (North)	41°01'18.2"N 72°26'19.9"W	Floating	0.45±0.03	07/22/2025 12:30–07/29/2025 11:15	5
					10/15/2025 10:00–10/19/2025 15:00	5
North Fork Big Oyster Company	Little Peconic Bay (North)	41°01'23.9"N 72°25'23.1"W	Bottom	6.29±0.30	07/22/2025 11:00–07/29/2025 11:05	6
					08/13/2025 11:00–08/20/2025 10:27	6
					10/24/2025 15:30–11/4/2025 14:30	0
Shellworks Oyster Company	Little Peconic Bay (South)	40°58'48.5"N 72°23'14.9"W	Bottom	4.40±0.29	08/13/2025 12:30–08/20/2025 11:00	6
Oysterponds Shellfish Company	Gardiners Bay (North)	41°07'43.9"N 72°19'22.0"W	Bottom	6.70±0.29	09/03/2025 14:30 – 09/11/2025 12:30	6
					09/18/2025 16:30 – 09/26/2025 12:30	6

Table 2. Summary of environmental conditions observed at each oyster aquaculture site. Values are given as the mean ± SD for each site during their respective deployment dates. There are two sites in which current speed was measured, but it was evident that the meter had become stuck on cage line by the presence of abnormally high values throughout the duration of the deployment.

Site	Date	Chl α ($\mu g\ L^{-1}$)	Salinity (PSU)	DO ($mg\ L^{-1}$)	Temperature (°C)	Current speed ($cm\ s^{-1}$)
Peconic Baykeeper	08/05/2025–08/11/2025	12.93±10.26	28.50±0.10	6.36±0.80	25.67±0.87	6.37±7.30
	10/15/2025–10/22/2025	4.77±1.41	31.59±0.06	8.53±0.29	15.92±0.52	8.43±6.68
Hampton Oyster Company	07/22/2025–07/29/2025	5.85±2.67	30.34±0.05	7.05±0.37	26.19±0.58	NA
	10/15/2025–10/19/2025	4.44±1.59	31.59±0.06	8.42±0.29	16.04±0.58	3.98±1.64
North Fork Big Oyster Company	07/22/2025–07/29/2025	10.99±2.41	29.14±0.04	6.65±0.37	25.57±0.25	5.07±2.16
	08/13/2025–08/20/2025	14.09±3.24	29.96±0.05	6.67±0.47	25.49±0.43	4.67±1.93
	10/24/2025–11/04/2025	4.26±1.69	31.53±0.15	8.88±0.17	13.57±0.91	6.04±3.75
Shellworks Oyster Company	08/13/2025–08/20/2025	13.25±2.98	29.69±0.13	6.72±0.40	25.84±0.46	9.44±4.78
Oysterponds Shellfish Company	09/03/2025– 09/11/2025	8.48±2.70	31.37±0.05	7.17±0.24	22.06±0.48	5.87±2.46
	09/18/2025–09/26/2025	13.50±4.73	31.59±0.04	7.38±0.46	21.05±0.27	NA

Table 3. Summary of collected pH and turbidity (FNU) values gathered from each visited oyster aquaculture site throughout their respective deployment dates. Values in the pH and turbidity columns are given as the mean ± SD.

Site	Date	pH	Turbidity (FNU)
Peconic Baykeeper	08/05/2025–08/11/2025	7.86±0.06	2.58±1.61
	10/15/2025–10/22/2025	6.69±0.05	-1.72±0.54
Hampton Oyster Company	07/22/2025–07/29/2025	7.91±0.02	6.17±1.05
	10/15/2025–10/19/2025	6.68±0.04	-1.83±0.41
North Fork Big Oyster Company	07/22/2025–07/29/2025	8.32±0.07	5.29±2.48
	08/13/2025–08/20/2025	8.16±0.05	3.33±3.80
	10/24/2025–11/04/2025	6.85±0.19	-2.17±0.51
Shellworks Oyster Company	08/13/2025–08/20/2025	7.89±0.03	0.02±0.85
Oysterponds Shellfish Company	09/03/2025– 09/11/2025	6.64±0.05	2.06±3.33
	09/18/2025–09/26/2025	6.82±0.08	3.82±3.10