



# Eastern oyster larval abundance in Great Bay Estuary, NH



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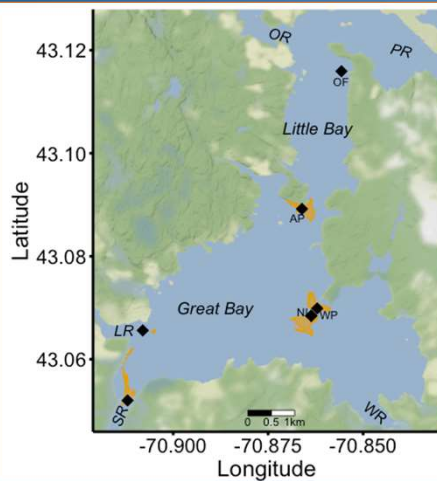
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## Abstract

This study characterizes larval abundances of settled spat and two early stages of *Crassostrea virginica*, D-hinge and veliger, in GBE from 2018 to 2020. It was found that overall, D-hinge larval abundances have declined significantly from 2018 to 2020, whereas veliger abundances have remained steady or increased. D-hinge, veliger, and spat settlement appeared to occur in the GBE before sampling traditionally has started (June).

## Introduction

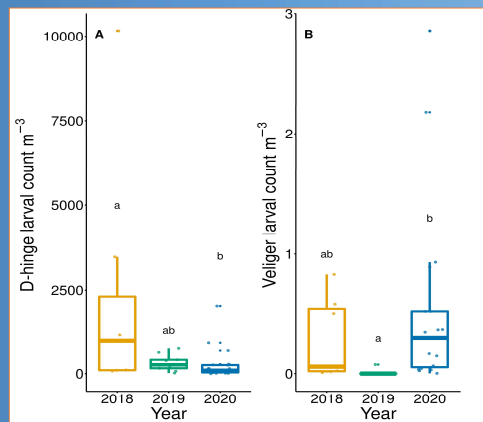
- Drastic declines in *C. virginica* abundances (Kirby 2006; Beck et al., 2011; Rick et al., 2016) have led to a loss of ecosystem services.
- Efforts toward oyster reef restoration have become increasingly common (Grizzle and Ward 2016).
- Current oyster populations in NH now are at <10% of what was present in the 1980s (Grizzle and Ward 2016).
- Currently, spatial and temporal preferences of larval dispersal remain largely unknown.



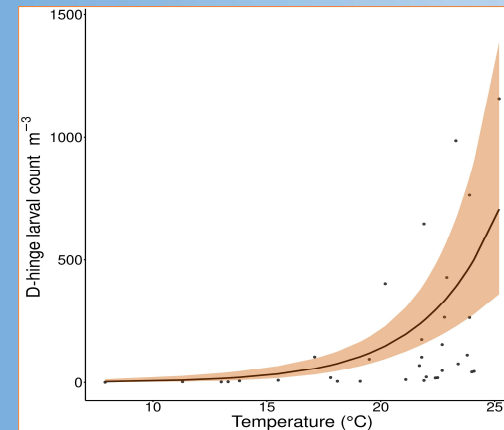
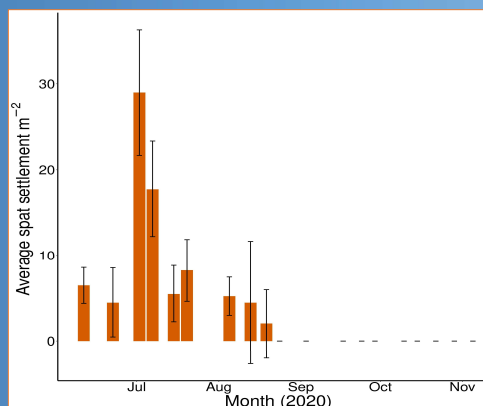
Map of Great Bay Estuary (GBE), NH. Natural oyster reefs are shaded in dark gray. Sites are marked with diamonds or labeled.

## Methods

- Semi-weekly larval tows conducted from Jun – Nov in 2018 – 2019, weekly larval tows and spat collection Jun – Nov of 2020.
- NOAA buoys for physicochemical data.
- Larvae enumerated by microscope and flow camera.
- Regression models for larvae and all variables.
- MANOVA for larval abundance between years.



- Oyster D-hinge populations are **significantly** less than they were in previous years.
- Spat is present as early as June, suggesting an earlier spawning even than previously thought.



## Results

- Significant differences in the number of D-hinge and veliger larvae across sampling years ( $F = 14.501, P < 0.001$ ).
- Spat settled differed significantly by date (Chi-square = 66.329,  $df = 3, P < 0.001$ ).
- Temperature was positively associated with D-hinge oyster larval abundance ( $P < 0.001$ , adj.  $R^2 = 0.5086$ ).

## Discussion & Conclusions

- Restoration efforts should occur earlier in the season than they currently are and should focus on variables other than temporal data.
- Future studies should incorporate modeling of larval distribution, phytoplankton composition, and setting substrate/availability into larval abundance.
- Temporal dynamics of eastern oysters are much more complicated than regression can show.

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