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GENETIC DIVERSITY AND PHENOTYPIC VARIATION WITHIN HATCHERY-PRODUCED OYSTER COHORTS PREDICT SIZE AND SUCCESS IN THE FIELD

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Study Description

Aquaculture holds promise for stock enhancement and restoration, yet cultivation practices may enhance variation between populations and reduce variation within populations, with uncertain implications for performance and resilience. We collaborated with a commercial hatchery to produce multiple cohorts of the eastern oyster (*Crassostrea virginica*) from field-collected broodstock. These cohorts varied almost twofold in genetic diversity, and cohort diversity was a significant positive predictor of oyster performance in the field. A readily measured characteristic of broodstock, the ratio of males to females, was positively correlated with genetic diversity and thus may offer a means to meet short-term production goals and to achieve conservation objectives.

Hughes, A. R., T. C. Hanley, J. E. Byers, J. H. Grabowski, T. McCrudden, M. F. Piehler, and D. L. Kimbro. 2019. Genetic Diversity and Phenotypic Variation Within Hatchery-Produced Oyster Cohorts Predict Size and Success in the Field. *Bull Ecol Soc Am* 100(4):e01586. <https://doi.org/10.1002/bes2.1586>



Photo 1. Testing oyster cohort performance in the field. Juvenile oysters from six hatchery-produced cohorts were affixed to experimental tiles and deployed on natural oyster reefs across the South Atlantic Bight. Photo credit: A. R. Hughes.



Photo 2. Identifying the role of predators in oyster mortality. Tiles were caged (background) or un-caged (foreground) to test the effects of predation. Photo credit: J. Byers.



Photo 3. Evaluating oyster growth and survival. Close-up of an experimental tile containing oysters from the GA/SC-2 cohort at the end of one of our field experiments. Oyster survival, size, and growth were evaluated across five experiments at a range of field sites. Photo credit: A. R. Hughes.

These photographs illustrate the article “Genetic diversity and phenotypic variation within hatchery-produced oyster cohorts predict size and success in the field” by A. Randall Hughes, Torrance C. Hanley, James E. Byers, Jonathan H. Grabowski, Tom McCrudden, Michael F. Piehler, and David L. Kimbro published in *Ecological Applications*. <https://doi.org/10.1002/eap.1940>