



Where will the next generation of NYC oysters come from?

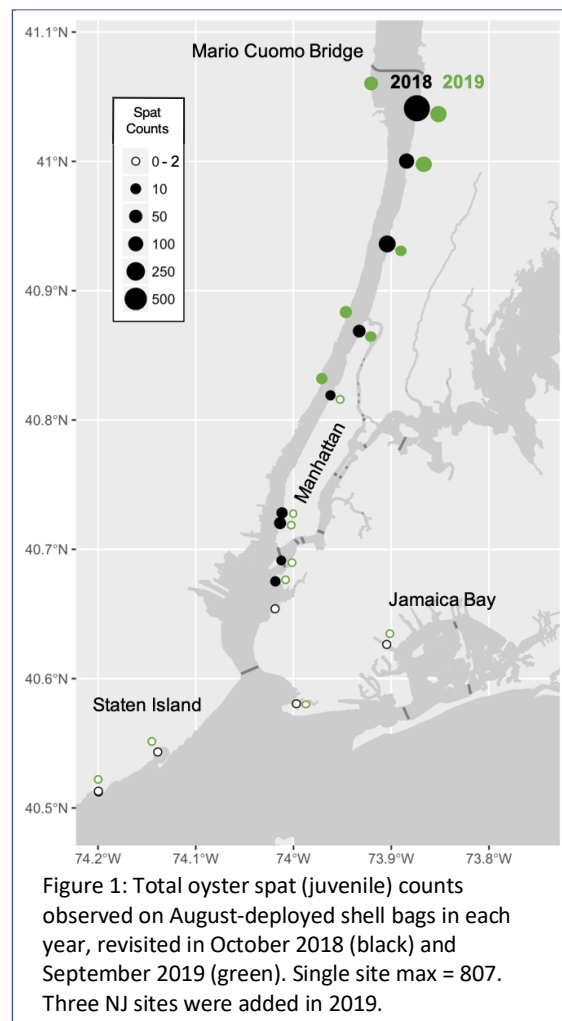
Eastern oysters were once abundant in NYC waterways. Oysters provided an important food source for New Yorkers and also served crucial functions in the ecosystem by filtering the brackish water and building reefs with their shells. Today, the only known wild breeding population of eastern oysters in the Hudson River Estuary (HRE) is restricted to near the Mario Cuomo Bridge (previously Tappan Zee; see map). Fortunately, the Tappan Zee oyster population shows strong, consistent annual reproduction.

Restoration of oyster populations to the lower HRE is of much interest to New Yorkers as well as conservation ecologists. There are two options for potential sources of oysters for populating restored habitat. Hatcheries can be used to produce oyster “seed” for planting at select sites. When there is an existing population it is desirable to produce seed oysters using the local, time-tested oysters as brood stock. Alternatively, Tappan Zee adults could be transplanted down river to expand the lower estuary breeding population. But if the Tappan Zee oysters can live and reproduce in the lower HRE estuary, wouldn’t they already have spread there? What is keeping the population isolated in a marginal, low salinity portion of the estuary?

Wild oyster reproduction generates tiny larvae that drift and feed in the tidal water column for 2-3 weeks before permanently settling on hard substrate and metamorphosing into “spat”, or juvenile oysters. This process is a critical part of oyster life history, generating connectivity among reefs within an estuary. Nearly every year since 2012 the Hare Lab and others have documented abundant spat recruitment (baby oysters settling) near the Mario Cuomo Bridge, but much less or none most years in the lower HRE. In 2018 the Hare Lab began collaborating with The Nature Conservancy and Billion Oyster Project, with the help of generous site hosts listed at the bottom of the page, to standardize monitoring of recruitment throughout the estuary.

No other regularly reproducing wild population is known in the HRE, so one hypothesis was that all wild juvenile oysters in the HRE come from the Tappan Zee population. Accordingly, we predicted that numbers of spat recruits would decrease gradually downstream from the Tappan Zee population. Mesh bags containing bivalve shells were placed at 15-18 sites along the HRE shores (Fig. 1) for oyster larvae to settle on during the reproductive season. The bags were retrieved and spat counted in October 2018 and September 2019 to generate the first large scale map of HRE oyster recruitment.

As the map illustrates, the highest abundance of wild spat in both years was found close to the Tappan Zee population. No other source of larvae (breeding oyster population) is evident. The Hare Lab and collaborators will continue this monitoring to test hypotheses about why the spat recruitment gradient is so steep (particularly in 2018); the hydrodynamics of the river may help oyster larvae stay close to “home”, or factors may increase larval mortality as they move south toward the ocean. There appears to be a lot that the remnant wild Tappan Zee population can teach us about how to overcome oyster restoration constraints!



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Thanks to our site hosts who provide secure shell bag deployment locations: Irvington Boat Club, Hastings Community Assoc, Yonkers Science Barge (Groundwork), La Marina, Inwood boat club, Ira Gershenhorn & Baylander, River Project, Red Hook Barge Museum, New York City Parks, Sebago Canoe Club, Princess Bay Boatmens Association, Richmond County Yacht Club