

# A Population and Distribution Analysis of the Invasive Asian Shore Crab (*Hemigrapsus sanguineus*) in Upper Barnegat Bay

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## Introduction:

The Asian Shore Crab (*Hemigrapsus sanguineus*) is an aquatic invasive crustacean in the United States. This crab is native to rocky intertidal habitats along the Western Pacific. It is believed to have been introduced to waters in the Mid-Atlantic through ballast water in the 1980s. Since then, Shore Crab populations have increased rapidly in quantity and geographic distribution, having spread as far north as Maine and south to the Carolinas.

Over the past decade, population studies of *H. sanguineus* in Long Island Sound and other regions in its invasive range have shown a dramatic increase at the cost of other native crabs.

Field surveys were conducted in upper Barnegat Bay in 2013 and 2015, which provided the first evidence of an extension in its range. An updated evaluation of their presence and population in 2023 was conducted at the same locations along with new potential suitable habitats.

## Methods:

- Field surveys conducted at 6 locations in upper Barnegat Bay, where 1 m<sup>2</sup> quadrats were placed at 10 m intervals at low and high intertidal zones.
- All organisms found were captured and identified. Asian Shore Crabs captured were also measured and sexed.
- Water temperature and salinity recorded, along with eDNA samples were taken at each site.
- 2 extra locations with rocks too large to be overturned had their environmental conditions recorded and eDNA samples collected.
- A seine net was used to compile a multi-species fish inventory at Ocean County Park, Bay Head Shores and Bay Point Harbor.



## Results:

Asian Shore Crabs were found at all locations in 2023. Their population increased in some locations but decreased in others compared to the surveys in 2013 and 2015. The presence of egg bearing females and young-of-the-year juveniles provides evidence of a reproductively active population.

# Populations of the Invasive Asian Shore Crab Seem to be at a More Balanced Status in Upper Barnegat Bay

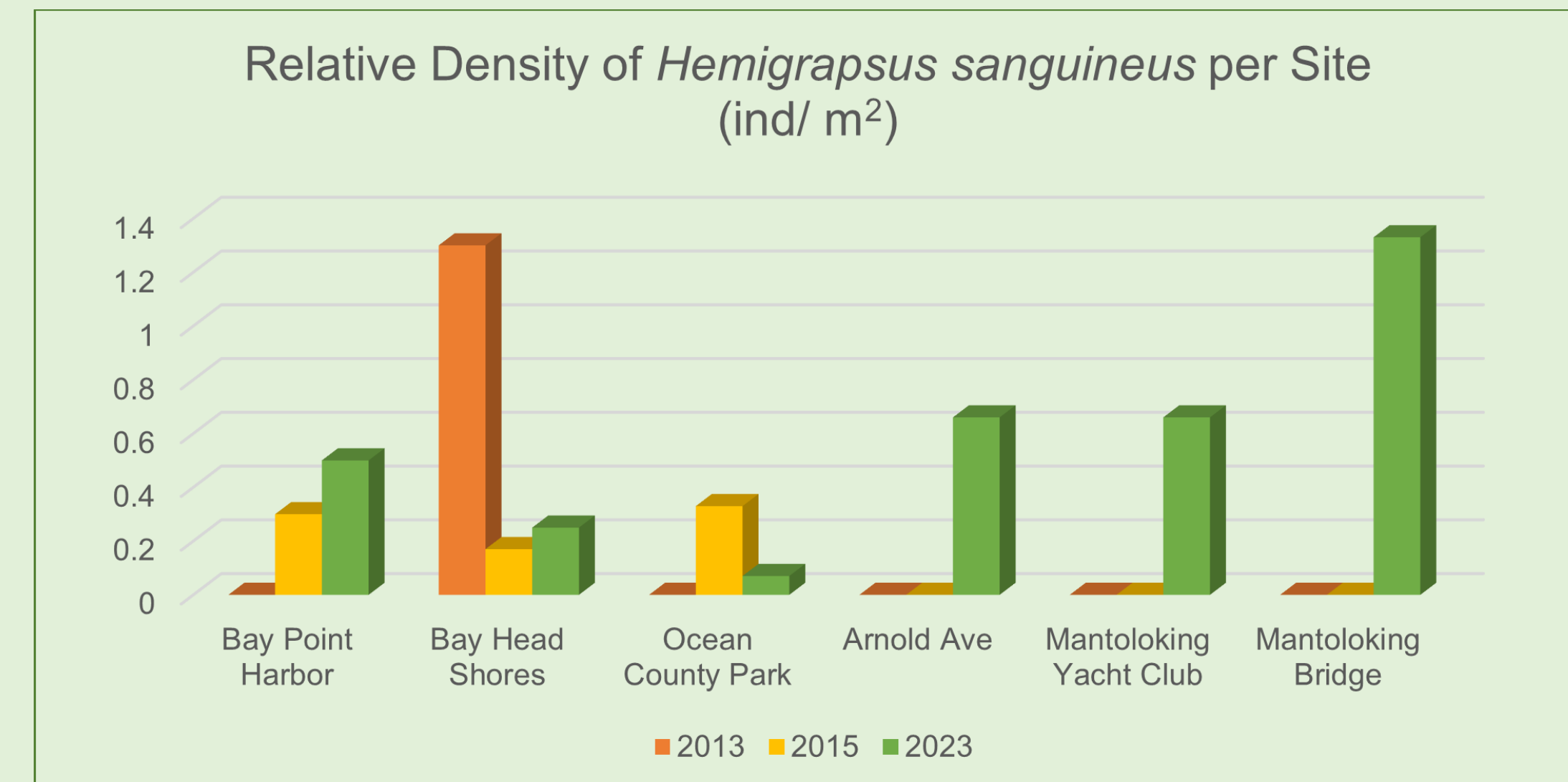


# Compared to Other Regions in The United States Where They are Also Invasive

## *Hemigrapsus sanguineus* Relative Density per Site (ind/m<sup>2</sup>)

Site	2013	2015	2023
Bay Point Harbor (BPH)	0	0.3	0.5
Bay Head Shores (BHS)	1.3	0.17	0.25
Ocean County Park (OCP)	0	0.33	0.07
Arnold Ave (AA)	-	-	0.66
Mantoloking Yacht Club (MYC)	-	-	0.66
Mantoloking Bridge (MB)	0	-	1.33

- Indicates location not surveyed



## *Hemigrapsus sanguineus* Compared to Other Crab Species Captured (2023)

Site	# of Quadrats	# of ASC	# of Other Crabs	ASC/All Crabs	Relative Density (ind/m <sup>2</sup> )
BPH	2	1	1	0.5	0.5
BHS	8	2	9	0.18	0.25
OCP	14	1	15	0.06	0.07
AA	3	2	2	0.5	0.66
MYC	3	2	2	0.5	0.66
MB	3	4	1	0.8	1.33
Total	33	12	30	0.28	0.36

Note: other crab species competing for space and food include: Blue crabs, Green crabs, Mud crabs, and Lady crabs.



Fig. 1: Inter-specific benthic organism survey



Fig. 2: Seining to compile a fish inventory



Fig. 3: water temperature and salinity measurements being recorded



Fig. 4: Ocean County Park, shoreline sampled

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