
# Center for Environmental Research and Coastal Oceans Monitoring (CERCOM)
# Molloy College

# Long Island Horseshoe Crab Network
# Annual Inventory Report

2014
FINAL REPORT

Dr. John T. Tanacredi, Director
Center for Environmental Research and Coastal Oceans Monitoring
(CERCOM)
at Molloy College
132 Clyde Street
West Sayville, NY 11796

Phone: (516) 323-3591
e-mail: jtanacredi@molloy.edu

Scientific Technical Assistant at CERCOM: Mr. Sixto E. Portilla
Administrative Assistant: Ms. Regina Gorney

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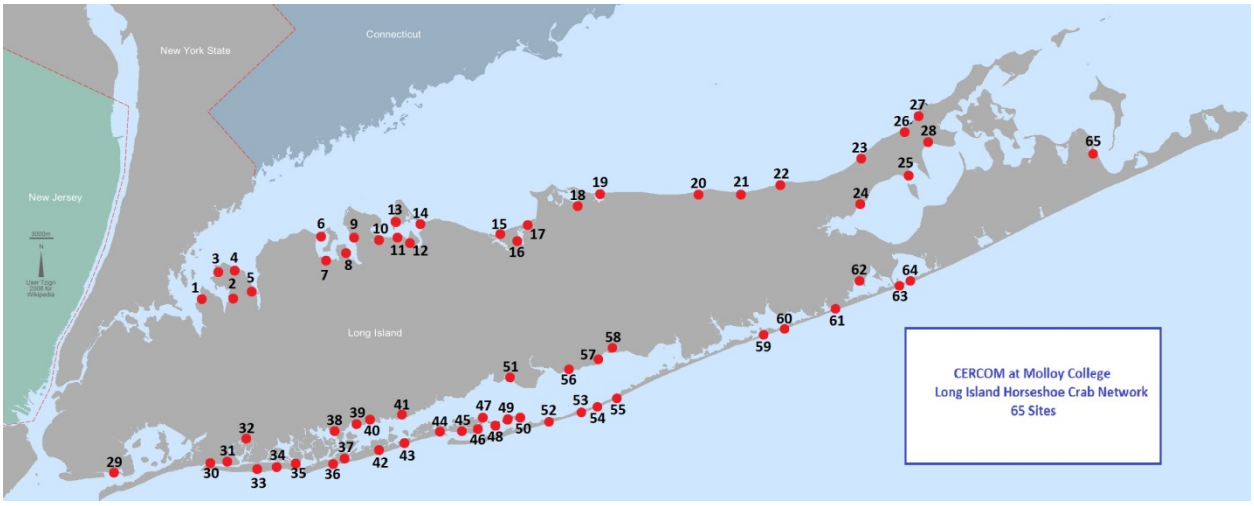
**Introduction:**

Considerable concern regarding the abundance of the North American Horseshoe Crab (HSC), *Limulus polyphemus*, along the coasts of New Jersey and Delaware prompted past moratoriums on collecting HSC for bait in New Jersey. The parallel population decline in migratory shorebirds such as Red Knots, *Calidris canutus*, Ruddy Turnstones, *Arenaria interpres*, and others that seasonally feed on the copious quantities of HSC eggs laid along this shoreline resulted in reduced HSC collection permits to numbers considered sustainable. In New York State's Marine District, which is mostly comprised of the Long Island coastline, there is no reliable or routine inventory network existing for determining HSC populations or habitat. Shorebird data, which has been collected by Audubon Chapters, the National Park Service and the U.S. Fish and Wildlife Service, as well as academia, have hinted at declining HSC populations. Anecdotal information from these same sources, as well as coastal enthusiasts and recreationalists providing support for a declining population of HSC in the metropolitan New York City area, serve to but these data lack scientific rigor to assess annual trends in local HSC populations and their relationship to human activity, commerce, etc. Molloy College's Long Island HSC Network commenced quantifying and recording data to address this void in 2003 and continues with the submission of this 2014 report.

**Objectives:**

This study is designed to provide annual inventories of adult HSCs visiting accessible spawning habitats along the New York marine coastline from the tip of Brooklyn to the tip of Montauk. Recorded data is formatted to be readily compared and contrasted with prior years' data for the assessment of trends in regional spawning populations. The design of this annual study draws from the abundant resource of citizen scientists with particular knowledge of their local environments who have answered the call to be stewards of this species.

**Map of Inventory Coverage**:




**Recruitment of Survey Volunteers:**

Each year Molloy Collage generates a press release targeted for local media serving as a call for local residents to become trained as volunteer in this inventory. These new recruits join the army of volunteers already established at their particular habitats and familiar with data protocols. Each new recruit participates in an orientation to the program which includes an introduction to the program, a brief history of the HSC, its ecological importance, a review of past results, a rigorous tutorial and field training at a local shoreline habitat.

**Data collection Protocols:**

All volunteers of the program are required to conform to the protocols of data collection:

1. Plan site visits around the local posted high tide.
2. Local high tides can found at www.saltwatertides.com going to the "tide portion of the website.
    a. Get data for tide sites nearest your sites.
3. Bring a log book and a pen.

4. Wear footwear appropriate to walk up to knee deep (walking this deep may not be necessary.)
5. When you arrive, identify the boundaries of the beach.
6. Beginning at one end, **walk at the water's edge** and count and log all females (F) and males (M) on land and visible in the water.
7. If the density of spawning adults is too great to capture in one survey, pace off a 100 foot length of representative HSC density and count within these boundaries.
8. Complete all site visits around the high tide.
9. Submit data by visiting www.molloy.edu/cercom/hscinventory

**2014 data:**

The geographical boundaries of all sites are verified through ArcGIS. All data submitted to this inventory is entered into an ArcGIS file layered by year. All sites included in the annual inventory report were visited at least once during the 2014 spawning season, which extends from May to July. For sites reporting more than one visit, the maximum number of individuals per visit for any given site is the data point for that site. This program is coordinated by staff of CERCOM at Molloy College, who is also responsible for coverage of all sites within the Inventory and handling of all submitted data. A brief summary of data are listed in Table 1. A comparison of all annual data the commencement of the program to present (2003 - 2014) demonstrates an approximate 1% decline in total HSCs seen per year (Figure 1). The spawning habitats where no HSCs were detected shows an increasing trend of almost 1% per year of all sites covered since 2003 (Figure 2).

| 2014 H.S.C.L.I. Inventory Results | |
|---|---|
| Sum of HSCs at all sites | 1694 |
| Reports submitted | 95 |
| Sites covered | 71 |
| None detected | 41 |
| % None detected | 58% |

**Table 1. Total spawning adult HSCs seen at all sites, number of reports submitted, number of sites covered, number of sites reporting none detected, and percent sites none detected**

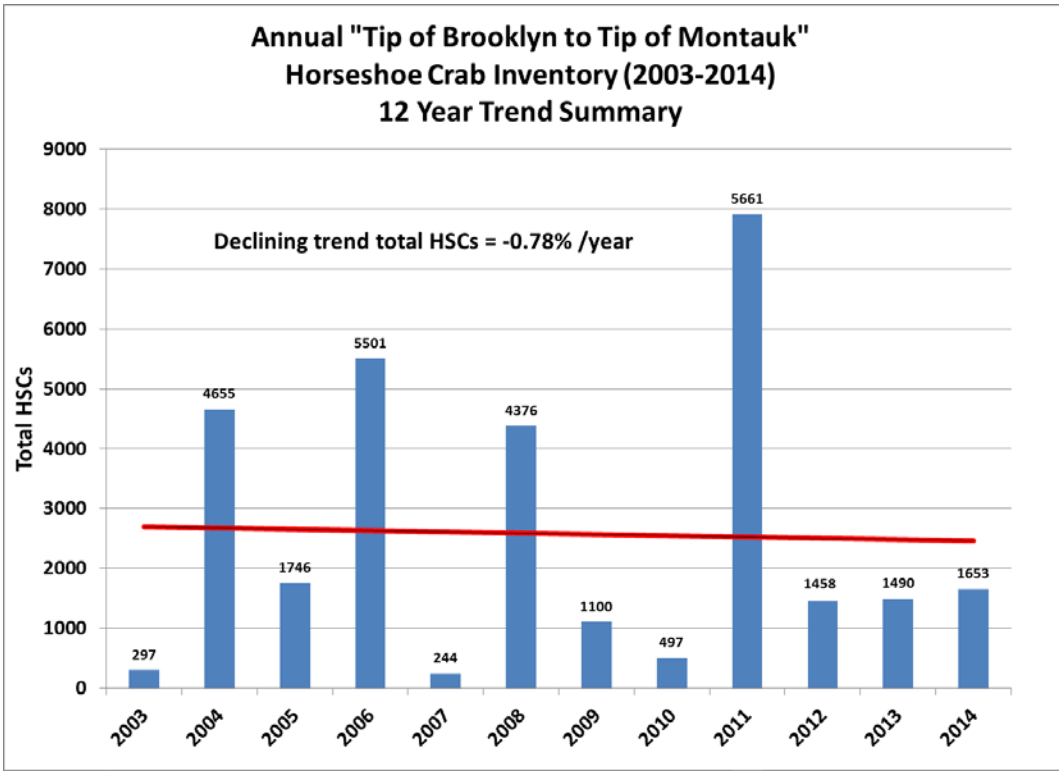



**Figure 1. Annual totals with calculation of declining trend for 12 years of data from 2003 – 2014. Declining trend = -0.78%/year, $r^2$ = 0.001, mean = 2577 ±2443.**

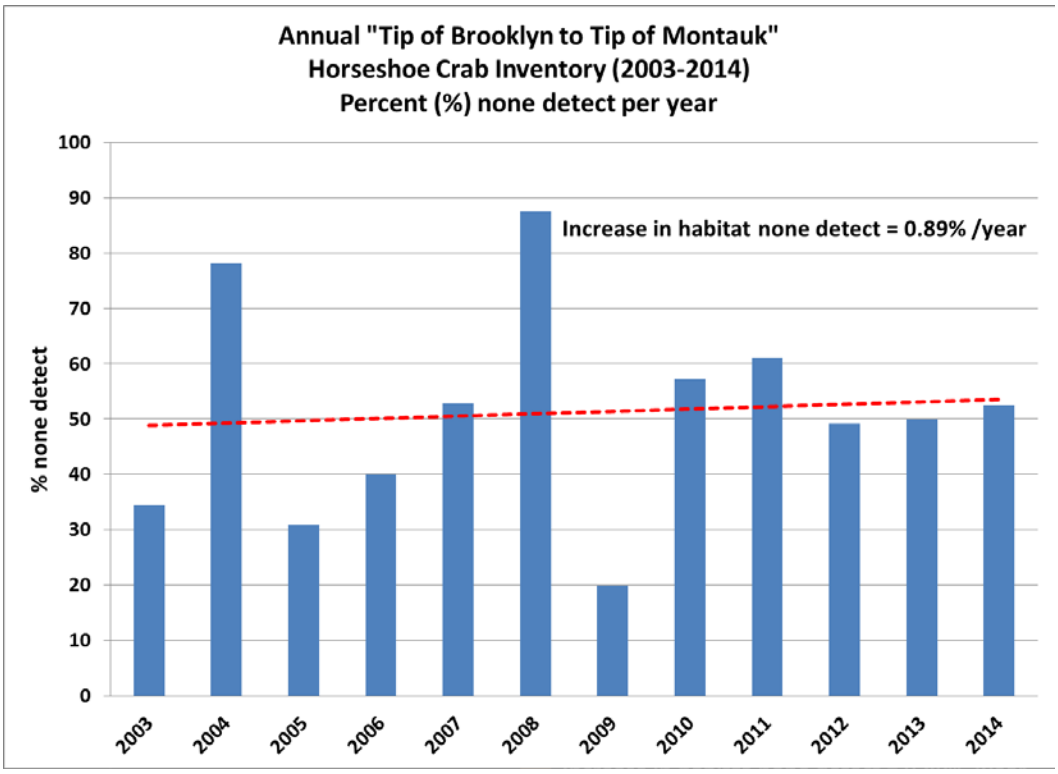



**Figure 2. Annual percent of habitats where no horseshoe crabs were detected, i.e., "none detected." Increasing trend = 0.89%/year, $r^2$ = 0.0066, mean = 51 ±19.0.**

**Results and Discussion:**

Results of the last 12 years of annual monitoring reveal (1) considerable reduced number of HSC than "remembered in the past"; (2) sites along the Long Island coastline now believed to support HSC have been found to have few to modest numbers of HSC; (3) a preliminary number projection of Limulus on Long Island at approximately 15,000 adult breeding individuals on beaches surveyed; (4) of the 108 beaches monitored since 2003, an annual increase of 0.89% per year has been observed for the number of beaches exhibiting "no breeding activity;" and (5) there has been observed an average of 0.78%/year decline in the total number of HSC's observed.

# Appendix A

| | NORTH SHORE (West to East) | | SOUTH SHORE (West to East) |
|---|---|---|---|
| 1 | Stepping Stone Park | 29 | Plumb Beach West |
| 2 | Leeds Pond | 30 | Beach 9 Playground Beach, Rockaway |
| 3 | Half Moon Beach | 31 | Bannister Creek, Rockaway |
| 4 | Sands Point Preserve | 32 | Hewlett Point Park |
| 5 | Prospect Point | 33A | Park Place, Long Beach |
| 6 | Center Island Beach Village Park | 33B | Long Beach Blvd Bridge, Long Beach |
| 7 | Theodore Roosevelt Memorial Park | 34 | Long Beach National Blvd at ocean |
| 8 | Sagamore Hill Beach | 35 | Bayside Drive, Point Lookout, Long Beach |
| 9A | Lloyd Neck bath Club Beach | 36A | Jones Beach Coast Guard Station |
| 9B | West Neck Beach | 36B | Jones Beach Fishing Pier |
| 10 | Gold Star Beach Park | 36C | Jones Beach Fishing Pier back beach |
| 11A | Crescent Beach Town Park | 36D | Short Beach near Coast Guard Station |
| 11B | Bay Hills Beach, Huntington | 37 | Zachs Bay/Jones Beach Theater |
| 12A | Fleets Cove Beach Park | 38 | Wantagh Park |
| 12B | Centerport Beach Park | 39 | Florence Ave Massapequa |
| 13 | Hobart Beach Park | 40 | Alhambra Road Massapequa |
| 14 | Asharoken Beach Park | 41 | Tanner Park, Copaigue |
| 15 | Short Beach | 42 | Tobay Beach |
| 16 | Cordwood Path | 43 | Gilgo Heading |
| 17 | Long Beach Rd | 44 | Gilgo State Park |
| 18 | Walnut St | 45 | Oak Beach |
| 19 | Mt Sinai Harbor Harbor Rd | 46 | Captree State Park East |
| 20 | Power Plant/La Plage, Wading River | 47 | Captree State Park south piers |
| 21 | Wildwood State Park, Wading River | 48 | Havemeyer Island |
| 22A | Reeves Beach, Baiting Hollow | 49 | West Fire Island |
| 22B | Roanoke Beach, Baiting Hollow | 50 | East Fire Island |
| 23 | 5155 Breakwater Rd, Mattituck | 51 | Atlantique |
| 24 | South Jamesport Beach | 52 | Ocean Beach FINS |
| 25 | 101-299 1st St, New Suffolk | 53A | Sailors Haven West |
| 26 | 205 Diamond Ln, Peconic | 53B | Sailors Haven East |
| 27 | 2150 Leeton Dr, Southold | 54 | Barrett Beach |
| 28 | South Harbor Park, Southold | 55 | Davis Park |
| | | 56A | Suff Co Beach near CERCOM |
| | | 56B | Maritime Museum Beach |
| | | 57 | Corey Beach |
| | | 58 | Watch Hill |
| | | 59 | Cupsogue Co Park |
| | | 60 | Pike's Beach |
| | | 61 | Howell Beach |
| | | 62 | Pine Neck Beach |
| | | 63 | Ponquogue Point Beach |
| | | 64 | Shinnecock Inlet W |
| | | 65 | Louse Point Town Beach |

# Appendix B

| **NORTH SHORE** | # per site |
|---|---|
| Stepping Stone Park | 1 |
| Leeds Pond | 2 |
| Lloyd Neck bath Club Beach | 5 |
| West Neck Beach | 10 |
| Center Island Beach Village Park | 0 |
| Theodore Roosevelt Memorial Park | 42 |
| Sagamore Hill Beach | 0 |
| Gold Star Beach Park | 10 |
| Crescent Beach Town Park | 0 |
| Asharoken Beach Park | 14 |
| Bay Hills Beach, Huntington | 0 |
| Half Moon Beach | 2 |
| Prospect Point | 9 |
| Short Beach | 17 |
| Cordwood Path | 0 |
| Long Beach Rd | 0 |
| Walnut St | 3 |
| Mt Sinai Harbor Harbor Rd | 0 |
| Wildwood State Park, Wading River | 0 |
| Power Plant/La Plage, Wading River | 0 |
| Reeves Beach, Baiting Hollow | 0 |
| Roanoke Beach, Baiting Hollow | 0 |
| 5155 Breakwater Rd, Mattituck | 0 |
| 205 Diamond Ln, Peconic | 0 |
| 2150 Leeton Dr, Southold | 0 |
| South Harbor Park, Southold | 0 |
| 101-299 1st St, New Suffolk | 0 |
| South Jamesport Beach, Peconic Bay Blvd, Jamesport, NY | 0 |
| total | 115 |

## Appendix B (continued)

| **SOUTH SHORE** | # per site |
|---|---|
| Beach 9 Playground Beach, Rockaway | 4 |
| Plum Beach West | 90 |
| Bannister Creek, Rockaway | 0 |
| Hewlett Point Park | 0 |
| Park Place, Long Beach | 0 |
| Long Beach Blvd Bridge, Long Beach | 0 |
| Bayside Drive, Point Lookout, Long Beach | 2 |
| Long Beach National Blvd at ocean | 0 |
| Zachs Bay/Jones Beach Theater | 11 |
| Jones Beach Coast Guard Station | 24 |
| Jones Beach Fishing Pier | 6 |
| Jones Beach Fishing Pier back beach | 0 |
| Short Beach near Coast Guard Station | 7 |
| Wantagh Park | 1 |
| Florence Ave Massapequa | 0 |
| Alhambra Road Massapequa | 5 |
| Tanner Park, Copaigue | 54 |
| Tobay Beach | 0 |
| Gilgo Heading | 0 |
| Gilgo State Park | 0 |
| Oak Beach | 0 |
| Captree State Park East | 0 |
| Captree State Park south piers | 0 |
| Havemeyer Island | 5 |
| East Fire Island | 0 |
| West Fire Island | 0 |
| Watch Hill | 7 |
| Davis Park | 1089 |
| Barrett Beach | 135 |
| Sailors Haven East | 1 |
| Sailors Haven West | 0 |
| Ocean Beach FINS | 0 |
| Atlantique | 0 |
| Howell Beach | 2 |
| Pine Neck Beach | 2 |
| Corey Beach | 19 |
| Suff Co Beach near CERCOM | 0 |
| Maritime Museum Beach | 0 |
| Cupsogue Co Park 1st crescent beach across trailer park | 2 |
| Pike's Beach | 69 |
| Shinnecock Inlet W, Rd I to riprap (East) | 0 |
| Ponquogue Point beach, bulkhead (N) to point (S) | 3 |
| Louse Point Town Beach | 0 |

# Appendix C

| Regions |
| --- |
| Little Neck/Manhasset Bay |
| Oyster Bay/Cold Spring Harbor |
| Huntington/Northport Bay |
| Hempstead harbor |
| Nissequogue River |
| Stony Brook Harbor |
| Port Jefferson Harbor |
| Mount Sinai Harbor |
| Long Island Sound East of Mt Sinai |
| North Fork |
| Rockaway, Jamaica Bay |
| Long Beach |
| Jones Beach |
| Hempstead Bay/East Bay |
| South Oyster Bay |
| Western Great South Bay, Babylon |
| Great South Bay |
| Great South Bay Fire Island |
| Great South Bay Main land |
| Dune Rd. and Shinnecock West |
| East Hampton |

# Appendix D

| Beach Captains |
| --- |
| Eric Morris |
| Sue Feete |
| Carol Ann Norton |
| Kata Macklin |
| Jacinta Marshall |
| Amanda Cipriani |
| Jacki Gutman |
| Peggy Maslow |
| Kelly Eames |
| Lauren Macri |
| Phil Cusimano |
| Kim Cusimano |
| Grant Kletter |
| Sixto Portilla |
| Evonne F. |
| Andrew J Schleider |
| Teresa Clark |
| Terri Rosen |
| Robin Schaper |
| Aubrey Peterson |

## Appendix E

# CERCOM MARINE SCIENCES

Survey Data

First name:

Last name:

Contact email:

Contact phone: ( ) -

Date:

Time:

Location name:

Name of nearest access road:

Length of beach/survey area:

Tide (low, high, middle ebb, middle flood, other):

Water conditions (calm, low surf, high surf):

Total number of HSC on beach or in water as visible from water's edge:

Number of females:

Number of males:

Number dead (M and F):

Comments:

submit